IL web tutorials - constraints and challenges in a HE perspective

Jette Hyldegård
Royal School of Library and Information Science, Birketinget 6, DK- 2300 S. Copenhagen, Denmark. Email: jh@iva.dk

Haakon Lund
Royal School of Library and Information Science, Birketinget 6, DK- 2300 S. Copenhagen, Denmark. Email: hl@iva.dk

The paper presents the results from a study on information literacy in a higher education (HE) context based on a larger research project evaluating 3 Norwegian IL web tutorials at 6 universities and colleges in Norway. The aim was to evaluate how the 3 web tutorials served students’ information seeking and writing process in an study context and to identify barriers to the employment and use of the IL web tutorials, hence to the underlying information literacy intentions by the developer. Both qualitative and quantitative methods were employed. A clear mismatch was found between intention and use of the web tutorials. In addition, usability only played a minor role compared to relevance. It is concluded that the positive expectations of the IL web tutorials tend to be overrated by the developers. Suggestions for further research are presented.

Introduction

Many myths exist about the digital natives regarding their searching abilities and digital information behaviour. They are generally satisfied about their searching skills and feel confident about their ability to find relevant information. From recent studies (e.g. Barlett & Miller, 2011; Connaway & Dickey, 2010) we know, however, that being ‘digital fluent’ is not necessarily congruous with a competent, critical and reflective approach to information. An educational backlog exists with regard to information literacy (IL) that needs to be addressed to keep up with digital developments and qualify knowledge creation and communication.

During the last 10 years many web tutorials have been developed with the aim of guiding students’ information seeking, research and writing behaviour, hence providing a platform for building IL knowledge and skills in addition to other IL activities. They are often stand-alone (offline) tools offered through the library. Standard software exists for building 2.0 user friendly web tutorials, e.g. LibGuide from Springshare, but only minor attention is generally paid to social media and internet searching by the developers, though the use of social media for course work is increasing (Educause Center for Applied Research, 2011). More over, the focus is often on the individual information seeker or student though many students participate in group work that would benefit from knowledge and skills about collaborative information behaviour and group work as well (e.g. Hyldegård, 2009).

This paper focuses on information literacy in a higher education (HE) context based on a recent research project evaluating 3 Norwegian IL web tutorials, involving students, teachers and librarians at 6 universities and colleges in Norway (Hyldegård et al., 2011). The aim was to evaluate how the 3 web tutorials served students’ information seeking and writing process in an study context and to identify barriers to the employment and use of the IL web tutorials, hence to the underlying information literacy intentions by the developer.

The paper presents the results from that part of the project which focused on the use and relevance of the 3 web tutorials compared to students’ information behavior 

Recent research on students’ information behavior

For the last 20 years a growing number of studies have investigated users’ information behavior to inform developers and providers of information systems and services. In the same way this research can positively inform the development of e-learning systems and approaches for information literacy. Information behavior is here defined as “…those activities a person may engage in when identifying his or her own needs for information, searching such information in any way and using or transferring that information” (Wilson, 1999, p. 249). Based on a review of 12 studies between 2005 and 2010 carried out for JISC, RIN and OCLC (Connaway & Dicky, 2010) some general results and patterns of students’ digital information behavior have been found, e.g.:

- Students feel confident about their ability to search for information (self efficacy)
- Ease and speed of access to information resources is important

1The IL research project was conducted by Niels Ole Pors, Camilla Moring, Trine Schreiber, Haakon Lund and Jette Hyldegård at The Royal School of Library and Information Science (RSLIS), Denmark
• Search behavior is characterized by ‘bouncing’, power browsing and least effort; e.g. digital documents are seldom read in full, but examined for information supporting arguments in an assignment, or downloaded just in case
• Students are interested in value added content to ease relevance assessment that often is considered difficult
• Search engines such as Google are very important; often used to get access to e-journals
• Digital access to information resources are preferred to the physical library, which still are perceived as collections of physical material
• Integrated search is preferred from the library website
• Personal contacts are playing a very important role in information seeking
• Students need general information literacy skills

Besides the general patterns listed above opinions, preferences and behavior also vary across students. Students’ information seeking behaviour reflects a paradox and a challenge to IL advancements; objectively they seem to have more difficulties today with regard to critically seeking and managing information, but they may experience it quite the other way round.

**Sundin’s 4 approaches to IL web tutorials**

A tutorial is a pedagogical genre with the aim of guiding and supporting the user’s use of a specific artifact. Apart from the format, different perspectives may be build into the design demonstrating different conceptions that may affect the user’s behavior accordingly. Olof Sundin (2008) has critically reviewed 31 Scandinavian IL web tutorials, which resulted in the identification of 4 approaches to IL:

1. the **source approach** – important to know different types of information sources; generally only limited information on internet resources
2. the **behavioral approach** – focus on teaching the user the ‘right information manners’, e.g. to use the library
3. the **process approach** – focus on physical actions and cognitive and affective experiences during time based on Kuhlthau’s Information Search Process-model (Kuhlthau, 2004)
4. the **communication approach** - focus on information seeking and information literacy as a social praxis rather than a rational and stepwise process

More approaches may co-exist in one web tutorial.

**Figure 1. Sundin’s model of four approaches to information literacy (Sundin, 2008, p. 38)**

Fig. 1 is showing the 4 approaches along two axes: information – user (individual/group) and subject/context dependent – subject/context independent. According to Sundin (2008) social aspects of information seeking should be part of IL, here contrasting it with the ‘generic skills approach’ that compares individuals’ attributes with IL standards and checklists. In addition, digital fluency has become even more important. To cite Barlette and Miller (2011, p. 4) it implies “…the ability to find and critically evaluate online information. It is combination of ‘old’ critical thinking skills, such as source verification, and ‘new’ knowledge about how the digital world works, such as understanding search engines. These are the bedrock skills necessary for the individual to use the internet to search, retrieve, contextualize, analyze, visualize and synthesize information effectively.”

**Research design**

The present study was carried out during April and May 2011 at three locations in Norway; University of Bergen (UiB), Stord/Haugesund University College (HSU) and Norwegian University of Science and Technology, Trondheim (NTNU).

**Research questions**

The purpose of the study was to explore the use and relevance of the 3 IL web tutorials in a study context, hence their potentials for supporting and enhancing students’ information competences in relation to research and academic writing. The study was guided by 2 research questions:

1. How important is the usability of the IL web tutorials, including the design, form and content to students’ acceptance and use of such e-learning tools?
2. How does the IL web tutorials support and match students’ information behavior and preferences in a study context?

The three IL web tutorials

The 3 IL web tutorials were Search & Write (Søk og Skriv) in Bergen, Advices & Tips (Råd & Vink) in Stord/Haugesund and VIKO in Trondheim (VIKO consists of a general part and a domain specific part named SubjectVIKO).

They are e-learning tools developed to support the research process as well as the information seeking process in relation to task based problem solving, e.g. writing an assignment. The standard for information literacy from the Association of College and Research Libraries (ACRL, 1989) has guided the form and content of the tutorials. Users may access the tutorial from the library’s website for self-studying. The interaction design combines text, quizzes, animations, illustrations and video sequences. The tutorial genre controls the format and form of interaction, e.g. by use of menus and navigation. A survey of Search & Write was published in 2010 (Forrat et al., 2011). In 2010 UBiT (University Library, Trondheim) initiated a study of students’ and faculty’s information seeking behaviour on the internet (Sentio Research, 2010).

Participants

The total numbers of participants were 20 undergraduate and graduate students from different studies and disciplines across the three institutions. Participants were 12 female and 8 male with an average age of 24,4 years. They were invited through the library at each institution and given a gift token for their participation.

Data collection

The research design was based on a user oriented approach, focusing on the individual student’s perceptions and experiences.

Sixteen students across institutions participated in a usability test of one of the 3 web tutorials, which also included a System Usability Survey (SUS) and a debriefing interview. The test design was pilot tested at the Royal School of Library and Information science (RSLIS) and adjusted accordingly.

Fifteen students across institutions representing different experiences of the web tutorials participated in a focus group interview, some of which also participated in the usability test. In addition, all participants filled out a questionnaire on demography, use of information sources and perceptions of own information seeking behavior.

The usability test was based on a situational usability perspective emphasizing the quality in use as experienced by the user in terms of efficiency, effectiveness and satisfaction (Hertzum, 2010).

During each usability test test persons were given a number of tasks to investigate their use of navigation tools, specific functions and elements, and to investigate the relationship between type of task and the preferred use of the web tutorial. The tasks generally represented two types of information needs; the verificative and the topical need (Ingwersen & Järvelin, 2005). The verificative need invites the user to search for factual information, e.g. “You need information on how to conduct a subject search in the database EMBASE”. The topical need may be either conscious or fuzzy and invites the user to explore information, e.g. “You need information on how to write a good assignment”. Verificative tasks were expected to invoke more index lookups or use of a search function compared to topical tasks, which in turn were expected to invoke more browsing and navigation. Each test session lasted 30-40 minutes and was initiated by a 3 minutes pre-orientation to let the participant get used to the test situation. The test tasks were administered one by one and rotated across participants. The maximum time limit for each task was 3 min. The participants were asked to speak aloud during task solving to record their verbal reflections. This may, however, have affected the time spent on each task (Tullis & Albert, 2008). Each usability test was followed by a short debriefing interview about the test person’s experience and perception of the web tutorial to validate observed behavior during the session. The test person also filled out a standard System Usability Score sheet (SUS) by stating his agreement to 10 statements on a 5-point Likert scale. The Morae software from TechSmith was used to record screen activity (e.g. task execution time, number of mouse clicks) as well as audio and video from each test.

The focus group interview focused on the participants’ experiences, perceptions and opinions of information seeking in a study context. It was structured in 4 parts: initial discussion of information seeking in general; the information seeking process, strategies, preferred information sources and relevance; IL-web tutorials; and closing. Minor tasks were introduced during the interview to encourage statements, opinions and discussion. Each interview was recorded (video and sound).

Data analysis

Test reports were made of each usability session, including video, actions and audio, which were analyzed to evaluate the quality in use, e.g. how each tutorial supported verificative and topical needs in relation to information seeking and writing.

To measure the test person’s interaction with the web tutorial data were recorded on how long time he spent

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2 Advices & Tips is no longer supported.

3 8 task were administered for VIKO and Advices & Tips, 9 task were administered for Search & Write.
on solving each task (time-on-task), the number of tasks solved correctly (task completion) and the number of tasks carried out within the given timeframe (task success). The SUS results in a general usability score, which can be used to compare systems. According to Tullis and Albert (2008) a SUS score below 60 is a relatively low score and a score around or above 80 is considered a relatively good score.

Data from the focus group interviews were analyzed according to 3 themes: the participants’ experiences of information seeking in general, their experiences and perceptions of the information seeking process in a study context and finally their experiences of web tutorials to learn about information seeking and academic writing, exemplified by one of the 3 IL web tutorials.

Limitations

Though the Danish and Norwegian language is close to each other, the Danish wording of test tasks, questionnaires and interviews may have influenced the participants’ perception and understanding of tasks etc., hence the quality of data.

Results

In this section results from the questionnaires, the usability study and focus group interview will be reported.

Preferences and perceived information behavior

Table 1 shows respondents’ reported familiarity with the 3 web tutorials. Thirteen of the respondents had been introduced to Search & Write and VIKO either in class or by the library, while only one respondent had prior knowledge of Advices & Tips.

Table 1. Number of participants who have been introduced to one of the 3 web tutorials or received training in information seeking

<table>
<thead>
<tr>
<th>Institution</th>
<th>HSH</th>
<th>UBB</th>
<th>NTNU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web-tutorial used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advices &amp; Tips (N=10)</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Search &amp; Write (N=6)</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>VIKO (N=10)</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Introduction to web tutorial by library etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Web-tutorial mentioned by teachers</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Web-tutorial introduced by teachers</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Received training in information seeking</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>13</td>
</tr>
</tbody>
</table>

Looking at Figure 2 showing participants’ frequency of use of specific information resources, VIKO was used by 40% of the respondents once a month or more compared to Search & Write (30%) and Advices and Tips (10%). Hence, none of the respondents were experienced users of the 3 web tutorials.

Facebook and Google were used on a daily basis as the most frequently used information resources, followed by Wikipedia.

Figure 2. Frequency of use of information resources including the 3 web tutorials (N=20).

As shown in Table 2, the majority of respondents used Facebook for social interaction, but some of the respondents also used it for study purposes. In contrast, Google, Wikipedia and the library were primarily used for study purposes and information seeking.

The 3 web tutorials were only used occasionally when preparing reference lists or more seldom in support of database searching.

Table 2. Reported use of information resources. (N=20).

When asked about their perceived information seeking skills the respondents reported a high degree of self-confidence; e.g. finding it easy to find relevant information (Table 3). Respondents also assessed their personal network as very important as part of their information seeking process. This ties in with the findings reported in Table 2 where Facebook, but also the library, was found to be important for communication. In correspondence with Table 2 Google was assessed very important in relation to information searching in a study context.
Usability study, including SUS

Looking at the results of the 3 usability tests including the results from the System Usability Surveys (SUS), a correlation between SUS scores and test persons’ verbal assessments and experiences was found.

![Figure 3. The SUS-score for the 3 IL web tutorials.](image)

Regarding Search & Write (with the lowest score) the test persons generally found it difficult to navigate and to know where to find the requested information. The main structure of the tutorial including the menu items was not understood, which was also apparent among participants in the focus group interview. Verificative tasks were not supported adequately, e.g. due to a lack of a search function. The index was used by some test persons as compensation and overlooked by others.

The search functionality in VIKO was often used by test persons to solve verificative tasks. Tasks of explorative nature were generally solved by using the left side navigation menu instead of the interactive ‘process-wheel’. During the focus group interview participants expressed that it was easier to decode the menu labels than the icons used in the process wheel; others failed to realize the wheel’s functionality. The division between ‘general VIKO’ and SubjectViko was not apparent to test persons.

Consequently the use of SubjectViko was often a result of coincidence rather than an informed decision. Asked about the supposed difference between ‘general VIKO’ and ‘SubjectViko’ in the focus group interview, none of the participants had problems in differentiating the one from the other. Although VIKO was assessed as easy to use, the lack of a clear content division in addition to an unclear presentation of search results may have affected the SUS score negatively. The fact that a single task proved impossible to solve by all participants may also have caused frustration and affected the score negatively.

Although the majority of the test persons’ had no prior knowledge of Advices & Tips the web tutorial achieved the highest SUS score among the 3 web tutorials.

Table 3. Respondents’ perceived information seeking behavior as stated on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

<table>
<thead>
<tr>
<th></th>
<th>Information seeking is time consuming</th>
<th>Search &amp; Write</th>
<th>Advices &amp; Tips</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VIKO</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>My personal network is a very important source for information and knowledge</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Google (and other search engines) is preferred when writing assignments, preparing presentations etc.</td>
<td>3</td>
<td>2,5</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>It is easy to find relevant information and resources for writing assignments, preparing presentations etc.</td>
<td>4</td>
<td>3,5</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>It is easy to assess the relevance of a search result</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Its easy to assess the quality of a website.</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>I do seldom need additional literature when writing assignments or preparing presentations (besides teaching materials)</td>
<td>2</td>
<td>2,5</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>It is difficult to use electronic library resources (homepage, OPACs etc)</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>I do not have any difficulty in using IT and computers</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>I find it easy to search for information</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Wikipedia was often mentioned as an important source for acquiring basic knowledge of a new subject dependent, however, on its acceptance as a reliable source across disciplines. Another important entry point for information seeking was the list of required readings delivered by the teachers. In addition, personal networks – virtual or real-world networks - were mentioned by many as important for acquiring knowledge of a subject. Supervisors, teachers and other students were mentioned here in addition to social networks on the internet.

With regard to participants’ perceived information behaviour both positive and negative feelings were mentioned. They expressed confidence in their own information seeking skills, including how to interpret and assess the quality of a result page at a general level. When it came to critical reviewing the relevance of information resources and finding the relevant information and limiting the number of relevant hits, e.g. in relation to a new subject, more constrains were experienced.

The participants generally had difficulties in expressing how web tutorials may support their information seeking needs and knowledge about information seeking in a study context. None of the participants with prior knowledge of the web tutorials had, for example, used the tools for acquiring information seeking skills. The tutorials had mainly been used as a tool for writing reference lists. However, a number of the participants would like to use IL web tutorials as an instructional tool if introduced at an early stage in their study and integrated in courses.

**Discussion**

The usability study has demonstrated the importance of designing IL web tutorials that clearly support the information seeking and writing process and ease access to content, e.g. by serving students’ verificative as well as topical needs.

However, the results from the usability study cannot explain why so few students used the three web tutorials in their daily study practice. If this was the case more students should have used Advices & Tips with the highest usability score.

Looking at the potential barriers to the use of IL web tutorials, it seems to be of great importance if the teachers refer to or integrate them in class, or if students have been introduced to the web tutorial by the library. None of the participants had, for example, got an introduction to Advices & Tips.

It is also worth noticing that the primary use of the three web tutorials was as tools for checking, controlling and verifying proper use of quoting due to reference list preparation and to avoid accusations of fraudulence. Further, the use of the tutorials was often motivated by product considerations (the assignment) and study requirements; none of the participants used the web tutorials out of an interest to better understand

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**Focus group interview**

The results of the focus group interviews supported the findings from the surveys and the usability test. Different strategies and approaches to information behaviour were identified across participants and disciplines. However, in a study context Google was stressed by all participants as an important source and a good starting point for getting an overview of a subject in preparation of a subject specific database search. A large number of the participants also used the national Norwegian opac BIBSYS; and appreciated the library driven instructions of BIBSYS in addition to other information seeking courses. Only few of the participants mentioned the use of web tutorials as an instructional resource in relation to BIBSYS or other databases, though instructional material such as videos was offered through the tutorials.
and learn about the nature of the information seeking process in relation to writing an assignment. This may also be associated with the fact that the participants generally expressed great confidence in their own search and it abilities in the survey, and found it easy to assess the relevance of a search result, which is in line with other recent studies of students’ information seeking behavior (e.g. Connaway & Dickey, 2010). However, when discussing constraints to information seeking in a study context information overload and finding the relevant information, hence deciding the relevance of information for an assignment was mentioned by most of the focus group participants. With regard to the present design, format and content of the web tutorials many of the focus group participants thought it would be more relevant to new students of the university or college. To be relevant to undergraduates and graduates the IL web tutorials need to be redesigned towards the ‘professional user’ or towards a specific domain (which actually was the underlying idea of SubjectViko).

The challenge here is how content and design of the 3 web tutorials should be adjusted to the students’ information seeking behavior and practice.

In correspondence with many also recent studies of students’ information seeking behavior (e.g. Connaway & Dickey, 2010; Forrat et al., 2011; Pors, 2007) participants were using many different information sources and strategies - digital, physical and social/personal - depending on type of task and importance, point in the assignment process, discipline etc. Moreover, it was interesting to notice the interest and use of social media for study purposes that corresponds well with recent findings made by Educause Center for Applied research (2011).

It is also clear from the results that students were more willing to use online catalogues and subject databases proportional to the year of study. The participants generally expected more interaction, functionality and integration with other platforms (mobile), tools and services. In stead of reading about quality in information seeking or writing it should be possible to translate directions directly into actions from the web tutorial. In addition, the IL web tutorials would benefit from being more naturally integrated in students’ information and study environment instead of being ‘walk-up’ tools.

Based on the results the influence from the web tutorials on students’ IL practice may be questionable. Students did not seem to be willing to spend time on studying the essence of good information practice in relation to writing an assignment. The importance of integrating web tutorials actively in students’ study practice, hence preventing information from being de-contextualized from its social practice, should not be ignored.

**Conclusions**

This paper has presented the results from a user study of three Norwegian IL web tutorials in a HE context. The focus has been on barriers to IL web tutorials in a study context such as the importance of usability and students’ information behavior.

Only few of the participants had heard of or used the IL web tutorials. Though none of the web tutorials were experienced as problematic or difficult to use the mere form, design and content of the web tutorial seemed to deviate from the needs and preferences of the students. A clear mismatch was found between intention and use as the web tutorials primarily were used as a tool for checking how to cite and make a reference list. This did not comply with the process oriented approach to information literacy intended by the developers (librarians). Further, the use of the 3 IL web tutorials could be linked directly to the interest and employment by faculty; e.g. if the tutorials were part of the requirements underlying a specific course or domain.

To conclude, a clear mismatch was found between intention and use of the web tutorials. In addition, usability only played a minor role compared to relevance. Hence, it seems that the positive expectations of the IL web tutorials may have been overrated by the developers.

In future further research is needed into the employment, use and essence of IL web tutorials serving higher education to contribute to the important question on how information literacy should be taught, practiced, motivated and supported in a study practice – and the role of the library in that perspective; e.g.:

- Referring to Sundin’s model what perspective of the IL web tutorial should be built into the design to support students’ information behaviour and study practice?
- Who should create the content? The library, students, faculty, others?
- How may web tutorials be integrated in students’ social practice and study practice to stimulate their critical thinking and facilitate their IL competencies in association with seeking, research, group work and writing?
- How should the effect of IL web tutorials in context be measured and evaluated?
- Are web tutorials as ‘genre’ the right design or e-learning format for teaching or learning IL?

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References


