Journal of Information Literacy

Article

The impact of library information literacy classes on first-year undergraduate students' search behaviour

Torunn Skofsrud Boger, Østfold University College. Email: torunn.s.boger@hiof.no

Hanne Dybvik, Østfold University College. Email: hanne.dybvik@hiof.no

Anne-Lise Eng, Østfold University College. Email: anne.l.eng@hiof.no

Else Helene Norheim, Østfold University College. Email: else.norheim@hiof.no

Abstract

The aim of this study was to investigate whether or not the library courses in information literacy (IL) taught at Østfold University College had an impact on the students' search behaviour. To find out, 19 students were interviewed and observed about this topic. The results showed that there were only slight differences in search behaviour between those who had attended the IL sessions and those who had not. Many students used Google as their starting point for searching for information. In this paper, we discuss how these findings can be implemented when developing future library courses on information searching.

Keywords

1. Introduction

Teaching students how to identify useful and relevant information in scholarly databases is a core activity in many academic libraries. However, do librarians succeed in teaching students how to search for information in the library's databases? Do students as a result of this training start using the library's resources to find information for their assignments? And perhaps most importantly, do their skills in information literacy (IL) improve?

Many university libraries have made attempts to evaluate their instruction of IL. As the results vary a great deal, it is interesting for libraries to assess whether the teaching influences the students' search behaviour or not. This study is a contribution to the debate on how students view IL and the influence of library classes.

In general, there are three different ways in which research on the teaching of IL has been carried out:

- Variants of pre-tests and post-tests
- Studies of students' term papers, portfolios and bibliographies
- Interviews with (and observations of) students

Different variants of pre-tests and post-tests represent a valuable method in order to improve teaching, and reflect the students' IL skills at the time the tests were taken (Portmann and Roush 2004; Gilstrap and Dupree 2008; Ivanitskaya et al. 2008; Hufford 2010; Larsen 2010; Fain 2011),

but do not say much about the students' information-searching behaviour in general. The use of pre-tests makes the students aware of what they do not know in advance and, as a consequence, they are better learners during the library's IL sessions. Some of the tests give the students an opportunity to provide important feedback to improve the teaching (Ivanitskaya et al. 2004; Gilstrap and Dupree 2008). Portman and Roush (2004) found that students' use of the library may increase as a result of attending a library IL course, but the students' information-searching skills did not improve. A study published by Fain (2011) showed that first-year students who responded to pre- and post-tests over a period of five years benefited from IL teaching. The material offers statistically-important information about students' learning, and could contribute towards improving IL teaching.

Students' term papers, portfolios and bibliographies may also be used to gather information about their IL knowledge and skills in order to improve teaching sessions (Hurst and Leonard 2007; Scharf et al. 2007; Samson 2010). Studies using this approach vary in methods and findings. Some studies showed that students who have attended library classes do not necessarily write better papers (Hurst and Leonard 2007). Scharf (2007) investigated students' portfolios and found that students who had attended IL classes wrote better essays, but were not capable of referencing in an adequate way. They were not adept at judging the quality of their sources and they did not manage to use their references to support their arguments in the different discussions of the topics. Hoffmann and LaBonte (2012) have, in partnership with faculty, assessed students´ assignments. A reflective, annotated bibliography revealed the research process, which was of great value for the assessment. The authors found that IL teaching had an important influence on the students' level of IL, and that the partnership between librarians and faculty was of great importance.

Other studies in the field have used interviews and observation as a method (Novotny 2004; Novotny and Cahoy 2006; Craig and Corrall 2007; Cmor et al. 2010). These studies reflect what the students know and think in relation to IL, and provide in-depth information regarding the influence of library teaching sessions on IL. Novotny (2004) used a think-aloud protocol with students who were searching a library catalogue. The students' spoken reflections demonstrated their knowledge and thoughts in relation to the difficulties of searching through the library catalogue. Novotny and Cahoy (2006) then compared the first-year students of the former study with another group of first-year students. The latter had attended classes in catalogue searching provided by the library. They concluded that the students, who had participated in IL sessions, had a slightly better understanding of how to use the library catalogue. Similarly, Craig and Corrall (2007) used semi-structured interviews in combination with pre- and post-tests. The interviews gave valuable information about the students' knowledge of IL. At Trier University in Germany, Leichner et al. (2014) undertook a project using information search tasks to assess students' learning. Their subsequent article could be used by other librarians to develop similar tests.

Cmor et al. (2010) found that students may know how to use their knowledge of IL immediately after IL workshops, but do not use their acquired information searching skills a few weeks later. This research applied a combination of tests during workshops; observation of students' presentations; and interviews with the instructors. Despite receiving IL training in workshops, where the students demonstrated that they had learned to search the library's databases, they chose to use internet search engines when they needed literature a few weeks later. Daugherty and Russo (2011) researched the lasting effects of an IL course, and the results were the opposite of Cmor's. Using a web-based survey, they found that students continued to use the IL skills taught by the library, especially database searching and advanced searching techniques.

The research methods of our study were selected based on the understanding that interviews and observation would provide additional information about students' information-searching behaviour beyond a mere IL knowledge test. The aim was to investigate how the students who took part in the study at Østfold University College described their own information-searching practices, and in what ways IL classes had influenced their search behaviour. Østfold University College has 6,500 students, equally divided between two campuses. The college offers courses within the disciplines

of education, health and social sciences, business, foreign languages, engineering, computer sciences, and theatre, mainly at undergraduate level.

The library has two departments, one at each campus, and the library staff consists of 17 librarians. This study is an example of how a small library may assess whether their students benefit from the teaching of IL. Central questions to be explored are: does the teaching of IL improve students' information searching practices, and should the teaching methods and content topics be discussed and changed?

2. Method

This study used qualitative data collection methods and a thematic content analysis of the data (Creswell 2014). Students on the nursing course and the teacher training course were interviewed to give descriptions of their subjective experiences. This was relevant to develop an understanding of every individual participant´s comprehension. In addition, the students were observed while conducting information searches, to establish whether or not they practiced information searching in the ways which they had described in the interviews.

2.1 The IL course

All students at Østfold University College are offered IL courses every year during their studies. The students who took part in this study were offered their first course in information searching and use of library services a few weeks into their first term. However, these courses were not compulsory. The lectures were given by librarians who were trained in teaching skills.

120 first-year students who attended the nursing course were divided into four groups and offered a two-hour lecture in a computer lab. About 80 students attended the IL course. The teaching included giving students information about relevant databases and referencing technique using the American Psychological Association (APA) style of referencing. The databases chosen were: the library catalogue (or OPAC); the Scandinavian bibliographic database of medicine, *SveMed*; and the international full-text nursing database *Cinahl*, on subscription from EBSCO. The classes were given as lectures. The students either listened to the lecture and watched the librarian performing information searches in the different databases, or alternatively they performed their own searches during the lectureon computers provided. At the end of the lecture, the students were given referencing exercises to work on in class. Two librarians alternated in teaching the four groups.

The teacher training students were given a two-hour lecture in a standard classroom. 20 students out of 40 registered students attended the session, bringing their own laptops. They were presented with an introduction to the library catalogue, the databases *Norart* (a reference database of Norwegian journal articles); and full-text database *Academic Search Premier* from EBSCO for finding academic journal articles in English. The librarian gave a theoretical lecture in information searching, critical use of sources, and referencing, but the students were not given any exercises during the two-hour class.

2.2 Participants

The names of the students who were present at the IL classes were registered. In this way, it was possible to identify those who had attended and those who had not been present at the IL teaching sessions. A few days after the session had been given, a number of students were invited to be interviewed and observed while performing an information search for an assignment given by their lecturers.

Ten students from the nursing course and ten students from the teacher training course were randomly selected and invited to participate in the study. Half of them had attended the IL classes and half of them had chosen not to attend. In the end, a group of 19 students actually took part in the study, as one student who had accepted was unable to participate.

2.3 Data collection

For the interviews, a semi-structured interview guide was developed. Semi-structured interviews were judged to be an appropriate method for data collection, because of the openness and flexibility which they provide. This adaptability seemed to serve the purpose to capture as much information as possible in each individual context. The students were not asked questions regarding their attendance (or non-attendance) of the IL course as the intention was to ask identical questions to every student and to find out how information-searching skills differed between the two groups. The interviews took place at the University College and were conducted on a one-to-one basis. Each interview lasted about 20 minutes and was tape-recorded, with the students' consent.

Directly after the interview, each student was asked to conduct a search for information in the library, using library resources and services. The students were asked to perform a search related to an assignment they had already received from their teacher. The intention was to see how their actions related to their answers in the interviews. In order to record data systematically, an observation protocol was developed. Each student worked in the library for about 20 minutes, being followed and observed by the librarian who had conducted the interview. There was no communication between the student and the observer during the observation, and the students did not talk while conducting the information search. The observer took notes. The focus of this notetaking was to gather any relevant information about the students' searching behaviour in order to identify differences or similarities in how the students described their behaviour and how they conducted their searches. Each student decided when the information searching was completed.

2.4 Topics in the semi-structured interview

The students were asked:
- How they searched for information
- How they chose their sources
- How they developed search strategies
- Which sources they knew
- How they used the information

2.5 Data processing and analysis

After the interviews had been transcribed, the transcripts and the observation forms were analysed. A thematic content approach, inspired by Braun and Clarke (2006), was adopted. In order to process the data collected, codes were created. Interview transcripts and observation forms for each respondent were analysed according to the codes created. One of the codes was information searching. From the coding, some recurring themes were identified. In addition, the software programme NVivo-10 was used. All the interviews were put in sources in NVivo-10. In this programme, codes and themes are called nodes and subnodes. The interview transcripts forms for each student were analysed by using the node structure. Finally, the node information searching had 12 subnodes. The use of NVivo-10 helped to see connections and relations in the data material. The use of queries in NVivo made it possible to identify the number of students who had given different answers to each question area.

Quotations from the interviews are presented in the results and discussion chapter to illustrate the themes that are discussed.

2.6 Validity, reliability and generalisability

By combining interviews and observations, the consistency between the students' answers in the interviews and their actions while performing an information search could be explored. For practical reasons, the interviews were conducted by library staff, and this may have influenced the validity, the reliability and the results of the study. It is possible that the students were in some way affected

by the interviewers' position or role as library staff and that they might have given different or more critical answers to a different interviewer. During the coding process, the coders communicated regularly to ensure consistency in transcription and coding of the data. This communication is important and necessary to ensure reliability and comparability in the coding procedure, according to Creswell (2014).

In qualitative research, comparing findings from other sites or arenas outside the ones studied should be done with caution (Gibbs 2007). However, there are theorists that emphasise that qualitative results may be generalised to develop a broader theory. According to Creswell (2014, p. 204) "…generalization occurs when qualitative researchers study additional cases and generalize findings to the new cases". There are several studies discussing the outcomes of IL training. Some of those studies found have similar results to this study. However, in the studies which present similar results, the methods are different from the method used in this study, which means that the results of this study cannot be directly compared with others. In addition, the specific details of other institutions are not well enough known to make generalisations based on the results from Østfold University College or other institutions. For example, it is not clear whether the students, the studies, or the teaching methods at other institutions are similar to those at Østfold University College. However, it may be possible to compare and draw conclusions from the results of this study within the whole group of first-year students at Østfold University College, since they are all offered the same IL introduction course.

3. Results and discussion: the students' use of Google, OPAC and other sources

3.1 The students' search behaviour in Google

The results show that nearly all the students, including those who had attended IL classes and those who had not attended, mentioned and used Google when searching for information. During the interviews, the students were asked how they collect literature and information for their assignments. They were encouraged to elaborate on why they make the choices they do and how they use the sources when working on their assignments. Google was frequently referred to, both by students who had attended the library instruction and those who had not. 16 out of the 19 students mentioned Google when they talked about searching for information and one of them explained that:

> It's because I feel that it [Google] is there and I get most search hits, which are easy to understand.

Another student stated that the internet was the easy option, because:

> …you almost always have internet access and it is easy to look up articles or information that you need…

One student announced a new discovery through the library IL instruction: Google Advanced Search:
> Eh, I learnt something new in the library classes; I learnt about the advanced search. I had not done that before. That was so much simpler and I got more precise search results!

She particularly pointed out learning about the advanced search process in Google, rather than the advanced search process in the library catalogue. One reason may be that Google is a more established way of finding information and habits are hard to change.

There was very little difference between the students who had attended the IL classes and those who did not. One of the students, who had not attended, put it like this when trying to explain some kind of search strategy:

First, I try to think of the theme. The first thing I usually do is look in my textbooks, use a marker pen and a notebook and write down books, pages and chapters I find useful. Then I try to search online. I usually start with Google and try to use advanced search to… limit the search. But I often find that what I'm looking for is not the first thing that shows up, even if in a way it is supposed to be the most relevant. So, I try books first and then the internet (…) Yes, I also try to use the databases in the library here, to see if I can find something.

A student, who had attended the library classes, recounted something similar:

I think about the assignment first; how I will go about it and when I don't find anything in the books I have, I search for the themes where I need more information. Then I go searching for what I think is missing; to see if I can elaborate on what I already have found. And then I only use keywords and after that I read some books and some journals and things like that; to see if I can find something relevant.

Even though the students who attended the IL courses did not relate any details in the interviews, they showed a form of understanding that the library can offer a number of resources they did not know anything about before attending. They had not used many of the resources yet, but many of them stated that they would be using them in the future - they had acquired new understanding of the opportunities the library can offer. Many of the students who had learned about the resources the library could offer, also stated that they had not been using the library much before, but that they saw the need for starting now:

I have never used [the library facilities]… I would like to buy my own books through the internet and… I have not used other alternatives. But I'm sure I will be using them from now on.

When I need to find information, I mostly use Google. But when I kind of need to start searching for academic literature, I think I will be using the library a bit, too. I feel that may be a bit safer.

Why do almost all the students mention (and use) Google? The literature refers to the net generation or the Google Generation. The Google generation is defined as people born after 1993, where the internet has been an important part of their lives since they were born (University College London 2008). While many students fit the Google generation, it is a complex picture. According to Jones et al. (2010), the new generation is not homogenous in its use and appreciation of new technologies. The library needs to recognise the special challenges when meeting the needs of this generation of students. The use of Google should not be disregarded, but rather used as a starting point in the promotion of academic databases. The students in this study also used other academic websites, which indicates a kind of understanding of relevant sources on the internet. The librarian instructors should take advantage of this in the introduction of academic databases. This approach is supported by Randeree and Mon (2011, p. 343):

Leveraging search tools that students are already familiar with as a platform for introducing concepts and techniques of more advanced information searching. Working with wild card searching and truncation in Google, helps the students make the conceptual leap into using these features in other reference sources.

Novotny (2006, p. 163) elaborates on why this is a good strategy:

Google searches are typically rewarded for making searches more specific and users may transfer the same strategies to library databases; expecting basic searching techniques can help the users build the skills they need to effectively use a tool that is quite different from the Web search engines they frequently use.

3.2 The students' search behaviour in the library catalogue

In comparison to the number that mentioned Google in relation to their searching, only 6 out of 19 students mentioned the library catalogue. Half of the group had attended the IL lessons. This coincides with the findings of the students' information-searching behaviour during the observation. Many students start their searching using Google, or end up using Google if their searching elsewhere is fruitless. Some students did use the library catalogue during observation, even though they had not mentioned the catalogue during their interviews.

It was suggested by at least one student that the library catalogue is perceived as difficult to use and understand:

> Then, I could visit the library to ask. I think it is easier to ask others for help, at least here in the library, because I find it a bit complicated to search on that web page.

One student went as far as considering using the library catalogue, though without being able to remember what it was called:

> What I thought was useful about the library course, was that you could access the library through the university college's homepage and search for Biblis [sic.] – that was something new for me! And when I tried to search, just to have a look with some keywords that I needed for my assignment, I got completely different… literary works there than with Google earlier. Just to check. And that was both new and useful and that hopefully I will be using throughout this process.

One of the students even gave herself credit for using the library's resources:

> … I have been clever and started using the library at the university college.

Another student admitted to not using the library to its full potential, but thought it would be wise to change, after learning about what the library can actually offer:

> I have not been that active in using the library here at the university college. And I can see that it has been incredibly stupid of me not to use the resources the university college is offering, because it was made pretty clear at the library training session that it is "just to visit us if you have a question" and, if we make sure we do so a bit in advance, we can also order books from other libraries.

This level of reflection was not found among those who had not attended the IL classes.

3.3 The students' search behaviour in other sources of literature

Some of the students reflected on how much literature they needed and why, without considering where the literature should be found:

> Yes, you should always refer to other sources than just the text books. And sometimes it is stipulated how many sources you should have. You want your assignment to be as good as possible, so you have to have some sources, several different sources to refer to. So you would want to find as many and as relevant sources as possible.

The students referred to various other starting points of their searching. Professional and subject-specific internet pages were mentioned. The curriculum textbooks were widely used as sources, as were Google, Wikipedia and selected discussion groups online. A few students remembered that they could visit the library and during the observations, a couple of students approached the librarian on duty for help.

One of the students explained it like this:

> *If I don't find anything on the internet, then I have to use other sources… I think I would probably use the internet before the library, because it's easier to search online. But I think I would visit the library, because there are so many people, who say that you have some pretty good material…*

The students were introduced to specific databases relevant to their studies. None of the students, who had been introduced to these databases, mentioned them during the interviews, with the exception of one student, who explained that during group work:

> *…some should try SveMed and some should try Cinahl and other sources…*

However, facing the practical situation under observation in the library after the interviews, over half of the nursing students tried searches in specific databases, such as Cinahl. In contrast, not one of the teaching students remembered, for example, Academic Search Premier, when searching under observation of a librarian in the library. This indicates that the IL training has had an influence on the nursing students' searching practices. How could the difference in outcomes between the two programmes be explained? One key explanation may be that the nursing students had an assignment which required that they find and cite an academic article. This assignment was due after the IL training session. Finding this article may have motivated the students to pay more attention during the instruction and apply what they learned.

3.4 Discussion of explanations of the students' information searching behaviour

The main finding in this study was that the students' almost exclusively used the search engine Google when they searched for information in relation to their studies. One possible explanation for the wide use of Google may be the students' background. It is important to remember that the students interviewed were in the first year of their studies. Most students had no prior experience of higher education (HE) and academic writing. It can be argued that students entering higher education have a lack of understanding of the academic world. Orme (2008, p. 69) states that "…first-year students are similar to immigrants to a new country…"

Our study supports this finding, in revealing that the students are unfamiliar with the expectations connected to HE. Previous practice was spoken about in some of the interviews:

> *I have only used internet and then some books we have at school. Then I ask my mum and dad, they may know something. That's what I used to do.*

> *I have not used the library before, but since we have got an assignment now, I have to find information in the library. I'm mainly going to ask a librarian for help!*

The library training courses often cover knowledge and information which is unfamiliar to many students. Is it reasonable to expect students to know or remember everything after having just had one two-hour IL training session? The shifting focus, from traditional library instruction to developing skills in IL, has unfortunately led to an underestimation of the number of lessons that are required. Badke (2009) asserts that it cannot be assumed that librarians can meet all IL needs with one to two hours of instruction. IL is not a remedial topic, but a whole new way of thinking about information and its use. It is essential that the IL courses include a progression from the basic use of information to an advanced approach. It is important to keep in mind that a two-hour session may not be sufficient to learn enough in order to use the databases successfully. However, one might expect students in HE to make sure they learn something from a two-hour session, and how to use this in relation to their own studying. One of the students interviewed felt that the library catalogue was more difficult to use than Google, and clearly preferred Google. This might indicate that the databases are more complicated to use than Google and that inexperienced students prefer the easier solutions. However, Georgas (2013) found that while the students thought Google was easier to use, they had an understanding that the discovery tool was better for scholarly information.

Novotny and Cahoy (2006, p.165) maintain that it is important for the students to repeat and apply what they have learned. They need more time when it involves learning something new: "… a single library instruction session did not provide sufficient tools to correctly locate and interpret …"

Several students in Novotny and Cahoy's study mentioned being bored during the IL instruction; the students could only concentrate for about 30 minutes. Even though none of our students talked about boredom or concentration problems, the results show that they did not remember much of the content of the IL session. Another possible reason why the students do not pay enough attention during the IL training may be because they consider themselves to be better at searching for information than they are. Many students consider themselves to be excellent searchers, although research shows that most users type a keyword or two into a search engine and rarely look beyond the first page of search results. (Novotny and Cahoy 2006). Despite their web-surfing skills and technological acumen, however, students may not know how to effectively search and locate scholarly research articles on a topic. (Novotny and Cahoy 2006) Library skills are often undervalued and regarded as less complex than they actually are. This is an attitude that many librarians encounter regularly.

4. Reflections on changing practice

This section presents some reflections on how academic libraries can adapt their practices to be more effective.

This study identified the necessity to rethink the practice of IL teaching at Østfold University College. First of all, Google should have a larger focus in the IL instruction. Google's advantages should be mentioned before the databases are introduced. Randeree and Mon (2011, p. 342) state that:

> In rethinking reference education, one approach is to leverage search tools that students are already familiar with as a platform for introducing concepts and techniques of more advanced information searching.

Geck (2006, p.239) suggests many approaches to providing and promoting digital resources, for example:

> Teacher-librarians can also impress this youthful clientele by becoming the school experts on the invisible Web or even Google. Youths can be offered instructional sessions on how to recognize misinformation and bogus information on the Web and teacher-librarians can show these students other skills important in evaluating the quality of web resources. To keep these youngsters' attention, teacher-librarians should provide instructional sessions about searching Google effectively, such as using Google Boolean searching and being aware of the Google Page Rank system. Other ideas include discussing search engine optimization and how corporations employ webmasters to raise their Google rankings.

She later continues:

> Teacher-librarians can reinforce that Google is not the best or first choice time wise in many situations. By showing students how print resources and electronic subscription databases can be used effectively to find answers, teacher-librarians can make students aware of the enormous amounts of time that may be wasted browsing and sorting through Google results. It is vital to communicate how answers can be found faster than by doing a Google search. Teacher-librarians can also reinforce these efforts by publishing success stories and anecdotes on the school library homepage.

It is important to demonstrate to the students the strengths of the academic databases and the library catalogue, in comparison to Google. The library at Østfold University College will soon start

using a new discovery tool, replacing the previous OPAC system. As a starting point for searching, the new discovery tool appears similar to Google and, for this reason, may also appeal to the Google generation. But the library catalogue will not replace Google, because they have different functions. One may imagine that the students will find the new discovery tool easier to use than the traditional OPAC. This will clearly also change our future IL training, but how and on which terms, it is too early to know at this stage.

Taking the needs and perspectives of the students as a starting point, and recognising that they do not exactly know what to expect when attending IL training, it is important that the library communicates this in advance. To accomplish this, cooperation with the teachers who work outside the library, teaching relevant topic areas on the respective courses is necessary. At Østfold University College, the teachers and the librarians collaborate, but the IL courses could be even better integrated into the regular courses in the students' study programme.

It is important that the librarian forms part of a cooperative team with the teachers committed to follow through teaching inputs with practical exercises and support. As Badke (2009. p. 132) emphasises:

> If there are few opportunities to watch students become information literate, academics will assume that it can't be done, that students just don't do research well and can't be taught how to handle information skillfully…

It is also important to show faculty that the IL teaching has a positive effect. Librarians should gather further evidence to prove that their teaching is effective and that the students get better results, otherwise they may risk losing the opportunity of giving IL classes. To the students, it is not evident that they need IL instruction. Moreover, academic staff are often not interested in teaching or assessing students´ IL skills. Even if the librarians collaborate successfully with the teaching staff and achieve positive outcomes, it is unlikely that the library-trainers will be allocated more time for IL instruction. Consequently, the librarians need to consider the opportunities for successful teaching when meeting the students in the classroom.

One of the biggest challenges is the diversity of the student group regarding their prior knowledge starting points. It should be established beforehand - what kind of digital competence they have and what they know about academic writing.

One way of meeting this challenge, is to map the students' capacity differences. This can be done by using different approaches. For example, the librarian may get the students to provide information through exercises at the beginning of a class or prior to a class. These answers can then help to find out where to put emphasis during the following instruction session as a way to develop and adapt the teaching inputs. This can motivate the students in their learning, as they find out what they need and want to learn more about. The articles of Bryan and Karshmer (2011) and Kipnis and Childs (2004) both offer different kinds of advice on how to develop the IL teaching recognising that most students use Google and find it sufficient. Their message is to adjust the methods to suit the Google generation. One technique to get the Google generation's attention may be the use of different participation tools for the students, for example clickers or audience response system software.

The intention is to use some of these ideas in the library IL classes at Østfold University College.

5. Conclusion

The aim of this study was to investigate how the first year students at Østfold University College describe their search for information and how information literacy classes influence their searching behaviour. Through the interviews and observation conducted, only slight differences between the students, who attended the IL training and those who did not, have been found.

Some of the students that had attended the course mentioned that they would use the library services and resources in the future, but apart from this, the responses from the two groups did not differ much. The first year students lack understanding of what is expected from them when entering higher education. They need to be taught and motivated to use relevant academic skills, such as information searching.

The results show that the students prefer Google for their information searching to the library databases. Most of them used Google as their first choice and the IL instruction did not initially change their searching behaviour. It is argued here that this must be taken into account, and that the library course content must be better balanced, by teaching both the use of Google and searching in academic databases. So far, the advantages of using the library resources rather than Google have not been made clear enough.

A follow-up study will be conducted among the third-year students, to compare their search behaviour with that of the first-year students.

References

Badke, W. 2009. How we failed the net generation. *Online* 33(4), pp. 47-49.

Bryan, J.E. and Karshmer, E. 2011. Building a first-year information literacy experience: integrating best practices in education and ACRL IL competency standards for higher education. *The Journal of Academic Librarianship*, 37(3), pp. 255-266. Available at: http://dx.doi.org/10.1016/j.acalib.2011.02.018

Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, pp. 77-101. Available at: http://dx.doi.org/10.1191/1478088706qp063oa

Cmor, D. et al. 2010. Course-integrated learning outcomes for library database searching: three assessment points on the path of evidence. *Evidence Based Library and Information Practice*, 5(1), pp. 64. Available at: http://ejournals.library.ualberta.ca/index.php/EBLIP/article/view/6509

Craig, A. and Corrall, S. 2007. Making a difference? Measuring the impact of an information literacy programme for pre-registration nursing students in the UK. *Health Information & Libraries Journal,* 24(2), pp. 118-127. Available at: http://dx.doi.org/10.1111/j.1471-1842.2007.00688.x

Creswell, J. W. (2014). *Research design : qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles, Calif: SAGE.

Daugherty, A. L. and Russo, M. F. (2011. An assessment of the lasting effects of a stand alone information literacy course: the students' perspective. *Journal of Academic Librarianship, 37*(4), 319-326. Available at: http://dx.doi.org/10.1016/j.acalib.2011.04.006

Fain, M. 2011. Assessing information literacy skills development in first year students: a multi-year study. *Journal of Academic Librarianship,* 37(2), pp. 109-119. Available at: http://dx.doi.org/10.1016/j.acalib.2011.02.002

Geck, C. 2006. The generation Z connection: teaching information literacy to the newest net generation. *Teacher Librarian,* 33(3), p. 19. Available at: http://www.redorbit.com/news/technology/397034/the_generation_z_connection_teaching_information_literacy_to_the_newest/

Georgas, H. 2013. Google vs. the library: student preferences and perceptions

when doing research using google and a federated search tool. *portal: Libraries & the Academy* [Online], 13. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=86965972&site=ehost-live.

Gibbs, G. (2007). *Analyzing qualitative data.* London: SAGE.

Gilstrap, D. L. and Dupree, J. 2008. Assessing learning, critical reflection, and quality educational outcomes: the critical incident questionnaire. *College & Research Libraries*, 69(5), pp. 407-426. Available at: http://dx.doi.org/10.5860/0690407

Hoffmann, D., & LaBonte, K. 2012. Meeting information literacy outcomes: partnering with faculty to create effective information literacy assessment. *Journal of Information Literacy, 6*(2), 70-85. Available at: http://dx.doi.org/10.11645/6.2.1615

Hufford, J. R. 2010. What are they learning? Pre- and post-assessment surveys for LIBR 1100, introduction to library research. *College & Research Libraries* 71(2), pp. 139-158. Available at: http://dx.doi.org/10.5860/0710139

Hurst, S. and Leonard, J. 2007. Garbage in, garbage out: the effect of library instruction on the quality of students' term papers*. Electronic Journal of Academic &* Special Librarianship, 8(1). Available at: http://southernlibrarianship.icaap.org/content/v08n01/hurst_s01.htm

Ivanitskaya, L. et al. 2008. How does a pre-assessment of off-campus students' information literacy affect the effectiveness of library instruction? *Journal of Library Administration,* 48(3), pp. 509-525. Available at: http://dx.doi.org/10.1080/01930820802289649

Ivanitskaya, L. et al. 2004. Research readiness self-assessment: assessing students' research skills and attitudes. *Journal of Library Administration,* 41(1), pp. 167-183. Available at: http://dx.doi.org/10.1300/J111v41n01_13

Jones, C. et al. 2010. Net generation or digital natives: is there a distinct new generation entering university? *Computers & Education*, 54(3), pp. 722-732. Available at: http://dx.doi.org/10.1016/j.compedu.2009.09.022

Kipnis, D. G. and Childs, G. M. 2004. Educating generation X and Generation Y: teaching tips for librarians. *Medical Reference Services Quarterly,* 23(4), pp. 25-33. Available at: http://dx.doi.org/10.1300/J115v23n04_03

Larsen, P. 2010. Aiming for assessment: notes from the start of an information literacy course assessment. *Communications in Information Literacy*, 4(1), pp. 61-70. Available at: http://www.comminfolit.org/index.php?journal=cil&page=article&op=view&path%5B%5D=Vol4-2010AR3&path%5B%5D=117

Leichner, N. et al. 2014. Assessing information literacy programmes using information search tasks. *Journal of Information Literacy,* 8(1), pp. 3-20. Available at: http://dx.doi.org/10.11645/8.1.1870

Novotny, E. 2004. I don't think I click: a protocol analysis study of use of a library online catalog in the internet age. *College & Research Libraries,* 65(6), pp. 525-537. Available at: http://dx.doi.org/10.5860/crl.65.6.525

Novotny, E. and Cahoy, E. S. 2006. If we teach, do they learn? The impact of instruction on online catalog search strategies. *portal: libraries and the academy,* 6(2), pp. 155-167.Available at: http://www.academia.edu/3074711/If_We_Teach_Do_They_Learn_The_Impact_of_Instruction_on_Online_Catalog_Search_Strategies

Orme, W. A. 2008. Information literacy and first-year students. *New Directions For Teaching And Learning*, 2008(114), pp. 63-70. Available at: http://dx.doi.org/10.1002/tl.317

Portmann, C. A. and Roush, A. J. 2004. Assessing the effects of library instruction. *Journal of Academic Librarianship,* 30(6), pp. 461-465. Available at: http://dx.doi.org/10.1016/j.acalib.2004.07.004

Randeree, E. and Mon, L. 2011. Searching for answers in a Google world. *The Reference Librarian* 52(4), pp. 342-351. Available at: http://dx.doi.org/10.1080/02763877.2011.584504

Samson, S. 2010. Information literacy learning outcomes and student success. *Journal of Academic Librarianship*, 36(3), pp. 202-210. Available at: http://dx.doi.org/10.1016/j.acalib.2010.03.002

Scharf, D. et al. 2007. Direct assessment of information literacy using writing portfolios. *The Journal of Academic Librarianship*, 33(4), pp. 462-478. Available at: http://dx.doi.org/10.1016/j.acalib.2007.03.005

University College London 2008. *Information behaviour of the researcher of the future: A Ciber briefing paper*. Available at: http://www.webarchive.org.uk/wayback/archive/20140614113419/http://www.jisc.ac.uk/media/documents/programmes/reppres/gg_final_keynote_11012008.pdf [Accessed: 6 February 2015]