Information Literacies of PhD Students: A Hermeneutic Dialectic Study within the Health Sciences

Elisabeth Nylander\textsuperscript{a} and Margareta Hjort\textsuperscript{b}

\textsuperscript{a}Research Librarian, Jönköping University Library, Jönköping, Sweden; \textsuperscript{b}Instruction Librarian, Jönköping University Library, Jönköping, Sweden

\textbf{ABSTRACT}

Doctoral studies offer a unique phase in the development and legitimisation of researchers, in which PhD students shift from consumption to production of knowledge. While literature exists concerning the information behaviour of graduate students and researchers, there is little work which focuses specifically on the information literacies of PhD students within the health sciences. To better understand this user group, we undertook a qualitative study at the Research School of Health and Welfare in Jönköping, Sweden. Twelve open-ended interviews with both PhD students and their supervisors were conducted and analysed according to a hermeneutic dialectic process. Findings revealed that the supervisors commonly assumed that PhD students already have necessary information literacy skills. Yet some of the students self-reported feeling uncertain when searching and getting ‘stuck’ with one strategy. Responses also indicated that the PhD students and their supervisors were often unaware of what services and support the library could provide.

\textbf{KEYWORDS}

Information literacy; PhD students; Health sciences; University libraries

\textbf{Introduction}

For libraries to invest wisely in information resources and services, there needs to be library and information science (LIS) research which investigates how specific groups interact with information. PhD students are of particular interest to academic libraries, since these students can be present or future faculty, meaning librarians can assist in the transformation of students to scholars (Fleming-May & Yuro, 2009).

\textbf{Literature review}

\textit{Information literacies within higher education}

Traditionally, information literacy (IL) has been defined in terms of behavioural needs or as explicit learning goals for how information is used. A
recent model from the Association of College and Research Libraries’ (ACRL) ‘Framework for Information Literacy for Higher Education’ represents a move from normative standards to a more situated definition of IL as ‘the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning’ (American Library Association, 2015). For the purposes of this study, we use information literacies in the plural form to signify dynamic learning activities occurring through interactions within specific social contexts. Information skills and their corresponding activities develop in domain specific areas such as disciplines or communities of practice (Lave & Wenger, 1991; Nicolini, Gherardi, & Yanow, 2003).

**Navigating the changing literacy landscape**

As the world of information has become more digital, doctoral research has also become an increasingly online activity (Vezzosi, 2009). Several studies have noted that many higher education students begin their searches on the Internet (Catalano, 2013) with Google commanding a universal influence across disciplines (Carpenter, 2012). While students still find the e-resources of libraries to be useful (Carpenter, 2012; Spezi, 2016), the transition from Google to these resources can be difficult due to barriers such as a lack of familiarity with what is available, limited library instruction, and perceived or real demands on time (D’Couto & Rosenhan, 2015). Wider access to technology does not necessarily equal improved information literacy (Carpenter, 2012; Korobili, Malliari, & Zapoundou, 2011; Patterson, 2009; Spezi, 2016; Warburton & Macauley, 2014), and students today are also met with the often overwhelming challenge of information overload (D’Couto & Rosenhan, 2015; George et al., 2006). This can be particularly difficult during the earlier stages of study when students have not yet had the chance to build up their expertise and support systems (Rempel, 2010).

**Faculty influence and the role of libraries**

While there has been rapid change in the (electronic) resources and tools available, faculty have not necessarily changed the way they teach research skills (Tuñón & Ramirez, 2010). Early and current studies suggest that faculty culture has had a long history of prioritising the content of research over its process (Hardesty, 1999); academic supervisors have focussed on imparting discipline-specific knowledge over high-level skills such as how
to conduct a literature review (Green & Macauley, 2007; Rempel, 2010). Other work points to an understanding of information literacy as something achieved by osmosis, i.e., faculty have held the belief that that students will eventually master the necessary skills to conduct research despite lack of training (Bury, 2011; Rempel & Davidson, 2008). In short, information literacy at the postgraduate level has more or less been implicit (Patterson, 2009). PhD students have reported developing literacy skills without direct instruction (Green, 2010), and at the same time, the literature also indicates that students have overestimated their search expertise (Korobili et al., 2011; Kuruppu & Gruber, 2006) or failed to develop strategies for using research resources in a proactive manner (Tuñón & Ramirez, 2010).

One of the most frequent and valued contact PhD students have during their education is with their academic supervisors. Supervisors are not just seen as a source of subject expertise, they have also been influential on the information seeking practices of their students (Carpenter, 2012; Catalano, 2013; George et al., 2006; Green, 2010). In fact, some studies found that both supervisors and students rarely asked their libraries for research support, because librarians were not believed to be qualified or able to help (Fleming-May & Yuro, 2009; Kayongo & Helm, 2009; Rempel, 2010). For example, faculty viewed librarians as service providers and not as peers with their own teaching abilities to contribute to the research process (Watson, 2010). Moreover, several studies have also demonstrated that supervisors and students were often not aware of the scope of library service or support available (Carpenter, 2012; Gruber, 2018; Kayongo & Helm, 2009; Saunders, 2012). Predictably, knowledge of library services has been tied to increased use (Catalano, 2013), and one of the most important factors found to encourage PhD students to approach librarians (Fleming-May & Yuro, 2009) or to test new search tools (Carpenter, 2012) is endorsement by a supervisor. While the influence of faculty on PhD students is paramount, the literature underscores the unique competency of research librarians:

Because research supervisors’ own practices may not fully embrace the newest shifts in the knowledge production and dissemination landscape, libraries play a critical role. Librarians are often the only professionals in this ecosystem whose role requires currency not only in information practices but also in shaping and providing access to the technical tools scholars use (Ince, 2019).

**Information literacies of PhD students within the health sciences**

There is a tendency in LIS research to generalise about metadisciplines, i.e., to classify academic fields into broad categories of discipline such as science or the humanities (Case & Given, 2016). For example, a frequent LIS assumption is that scholars within the natural sciences mainly use journals
and humanities scholars mainly use books. Such conjectures ‘may be true as they go, but they do not further our understanding of the important mechanisms of information seeking, nor are they particularly useful in application, as in designing university information systems to serve particular disciplines’ (Case & Given, 2016, p. 288). Another, more nuanced approach is to consider the importance of context. Disciplines entail unique research cultures and traditions (Talja, Vakkari, Fry, & Wouters, 2007); an ‘academic discipline “disciplines” its members to behave in certain ways’ (Sundin, Limberg, & Lundh, 2008, p. 22). For this study, the field of health sciences is defined as narrower than a metadiscipline but wide enough to encompass several smaller disciplines of science focussing on health or health care, e.g., medicine or nursing.

Although there is an abundance of research concerning information practices within educational settings, few studies have centred on PhD students as a unique group. In a meta-synthesis of the literature published between 1997 and 2012 on graduate students’ information-seeking behaviour, only 11 studies were identified which dealt specifically with PhD students (Catalano, 2013). A narrative review with the purpose of investigating changes in PhD students’ information seeking behaviours, also found that most studies grouped PhD students together with other graduate students or with other researchers (Spezi, 2016). In our own review of scholarly articles published between 2009 and 2018, only 0.3% of the initial data set (7 of 2317 records) directly addressed the information literacies of PhD students within the health sciences (Nylander & Hjort, 2020).

**Study aims**

PhD students constitute a unique library user group, characterised by the transformation from student to researcher within a specific discipline. Recent reviews of the LIS literature reveal that there is little research devoted solely to PhD students; moreover, there is a lack of knowledge about the information literacies of PhD students within the health sciences. In short, one of our own user groups is underrepresented in the academic literature. The purpose of our investigation was to better understand the information literacies of those we support as librarians, i.e., PhD students at the Research School of Health and Welfare in Jönköping, Sweden. This study aimed at answering the following research questions:

- How are the students’ information literacies described?
- How can the students’ information literacies be supported?
- What is it like to be a PhD student?

These were explored from the perspective of both the students and their supervisors.
Methodology
To examine the nature of information literacies of PhD students, our study takes a hermeneutic dialectic approach based on the Fourth Generation Evaluation (FGE) model (Guba & Lincoln, 1989). As a qualitative methodology, FGE is most commonly used within the social sciences, but recently it has also been put forth as a form of evaluation within LIS, allowing researchers to ‘explore participants’ experiences in various contexts and to provide findings that include a wide variety, though not an exhaustive account, of these experiences’ (Fitzgibbons, Kloda, & Miller-Nesbitt, 2017, p. 776). This interpretive method assumes that reality is constructed through the interactions between the observer and the observed (Guba & Lincoln, 1989) and employs constant comparative analysis (Glaser, 2006).

Population of study
The Research School of Health and Welfare is part of Jönköping University in Sweden. It has a trans-disciplinary approach and students can pursue doctoral degrees in the following: Health and Care Sciences, Welfare and Social Sciences, and Disability Research. At the time of the study, 56 students were enrolled with the majority (about 70%) in Health and Care Sciences. While supervisors for these students may be employed by other institutions, respondents for this study were all part of the Jönköping University faculty.

Sampling and recruitment
Before recruiting participants, the Research Ethics Committee of Jönköping University was consulted, and it was established that the study fell within the limits of organisational improvement measures and did not require further vetting by the Swedish Ethical Review Authority. Written consent was obtained from all participants prior to the interviews.

Because the aim of the study was to achieve an information-rich understanding of a small and specific group, we used a form of purposeful sampling (Patton, 2015). Test interviews were conducted with recent graduates from the school to calibrate the general content of the interview guide. These graduates were then asked to suggest other PhD students that they thought might have different or additional insights. At the end of each successive interview, participants were asked to make similar suggestions about other possible interviewees.

Consistent with the constant comparative method (Glaser, 2006), the process of adding participants continued until information from the interviews became redundant or a consensus about topics occurred. In addition
to the two test interviews in September and October 2018, a total of seven interviews were performed with students during November and December of 2018. A variety of research foci were represented among the respondents, such as social work, oral health, and rehabilitation. The students could also be found at various stages of the PhD process, from recent acceptance to the program, to working on a first article, to being in the process of defending the doctoral thesis.

Before interviewing the academic supervisors, a faculty member from the research school was asked to provide feedback on the interview guide and to suggest interview candidates that might approach supervision in ways that differ. As with the interviews with the PhD students, purposeful sampling continued until a feeling of data saturation occurred, resulting in five interviews with academic supervisors during January and February of 2019. All the interviewees had experience with supervising PhD students, but the amount of time they had been employed by Jönköping University varied from just a few months to several years.

**Data gathering and building the construction**

The first author conducted the semi-structured, one-to-one, and face-to-face interviews. All interviews were conducted in Swedish. Each interview lasted between 45 and 60 min and took place at a locale of the interviewee's choice, either in the respondent's own office or in a private room at the library. Shortly after each interview, both authors created a construction, or written account describing our interpretation of the study participant's experiences. With each new interview, the construction was reworked to include the experiences of all those interviewed, and subsequent study participants were invited to confirm or refute the developing construction. The interview guide (see Appendix A) was also revised based on the topics that emerged. After all the interviews were completed, each construction was edited for clarity and confidentiality and shared with its participants as a follow-up questionnaire via e-mail, i.e., one questionnaire for the PhD students in February 2019 and one questionnaire for their supervisors in March 2019. The constructions were divided into short sections based on topic, and participants were encouraged to comment on whether the construction included their experiences. This allowed participants who were interviewed early in the process to react to the construct generated through subsequent interviews. This resulted in more accurate, inclusive, and rich data than would have been possible if participants had been asked to answer questions in isolation from the response of others. In this way, the study provided an opportunity to analyse and synthesise the information literacies of PhD students from several perspectives at once, i.e., the
students themselves, their academic supervisors, and the researchers who are also practicing librarians. The final constructions, including direct quotations, were then translated into English for the purposes of publication.

Findings

The constructions presented below are based on the original research questions as well as emergent themes from the data. For example, while the original aim of the study was to examine the information literacy practices of PhD students, what often came up during the interviews was how participants experienced what it means to be a PhD student. As appropriate, quotes from the respondents have been used to further illustrate the findings.

The PhD student construction

Finding information – publication types and search techniques

The students mostly searched for scholarly articles in order to find the most current research. Books were mainly used for more in-depth reasoning concerning questions of methodology and theory. The exception to the rule was within the field of social work, where books were also considered to be sufficiently up-to-date and necessary for more developed arguments.

Almost every student reported using Google Scholar and how easy they found it to be. Google Scholar was primarily used to find articles in full text, but it could also be used to check citation practices or to create an overview of the research area.

One of the students mentioned using Primo, the discovery tool located on the library website. Primo was mainly used to see if the library provided access to publications in full text rather than to explore a topic. One of the other students used Google Books to evaluate literature before requesting that the library make an interlibrary loan.

Databases were used by all the students, but to a varying extent and at various levels of difficulty. The tendency was for a student to learn how to use one database, such as PubMed or Sociological Abstracts (ProQuest), and to be content with that strategy throughout the entire PhD process. In other words, databases providing different subject coverage were seldom explored.

Some of the students said they take advantage of others’ reference lists as a search method. Articles are checked for which authors or other articles are ‘big names’ or mentioned most often. This was seen as a way to better understand the research field and confirm that one was ‘on the right track’. However, none of the students mentioned using citation search tools, such
as the Scopus database or Web of Science platform, to facilitate this practice.

**Search competency and getting help**

The students described information searching which varied from simple to more advanced search strategies. For example, a common strategy was to only search in Google Scholar based on one or two search words. A more advanced strategy could be to try several search words and combine these with Boolean operators and/or limiters in a subject database. While some students felt they were able to master more advanced search techniques and features, many students felt uncertain about their ability to adequately conduct database searches. This insecurity was reported with expressions such as ‘wasting time’ or ‘fumbling around’. One student noticed this lack of expertise most clearly when trying to advise undergraduates on how to search for coursework. The students’ self-evaluation of competency levels fluctuated greatly from ‘I am really terrible at searching’ to ‘I have known how to search for quite some time’.

None of the students had received help in how to search for information from their supervisors. Many expressed the assumption that PhD students already know how to search. Several of the students reported that supervisors would suggest references or send them copies of articles. This was experienced as both helpful yet problematic, since students often found it difficult to judge how relevant these tips were for their own research. One student used a supervisor’s EndNote library of references as a main resource, while other students thought they were better at seeking information than their supervisors. As one student said of search help from the supervisor, ‘Can’t get anything there’.

Most of the students had, at some point during their doctoral studies, met with a librarian. A few had also attended courses or seminars by the library on information seeking. While all the students said that they knew they could contact the library for help, several were unsure or unaware of what kind of assistance was available. As one student explained, ‘…impressed by the support you can offer, but we don’t know about it’. Another said that as a new PhD student it is easy to end up in ‘how to do it’ and forget ‘how to think about it’, so it would be good to be able to book an hour or so with a librarian to discuss ‘how to think about it’. Several students complimented the library on ‘good support’ and ‘quick help’. One student said, ‘You all are part of my network’. Another student said that the library should continue to strengthen and maintain what it already does well, i.e., be knowledgeable and reliable. The student summed this up as, ‘I feel like we work together. I feel like you see me’.
Information use and evaluation of sources

Experience made a big difference in how the students saw their ability to use information in a critical manner. The further along a student was in the program, the more confidence was expressed in information competence or the ability to sort and evaluate sources. At first, students experienced a feeling of drowning in material. Several students reported having to read ‘everything’ or printing out lots of articles when they began their doctoral studies. One student explained that sorting was impossible because s/he was too new, ‘I blindly follow what the supervisor gives me’. According to another student, how to evaluate which sources are relevant cannot be taught, ‘I wouldn’t be able to transfer that knowledge if I had my own PhD students; they have to develop that themselves’. Towards the end of the program, the students felt more confidence in sorting through sources. For example, it was more common to simply skim the title/abstract of articles or just read the discussion part of an article to determine its relevance.

The concept of IL

Information literacy (IL) was a new concept for all the students, and it therefore provided a platform for further discussion about their competency in information searching and use. One of the students saw IL as a process that starts early in life, when we are school children. For this student, IL meant not only being able to skim texts but also being able to read slowly to carefully consider what one has read. A few of the students talked about how they had developed their own systems for sorting through information, e.g., a system of folders/binders. Several of the students had noticed a significant improvement in their IL competencies due to their doctoral studies. Many felt they were better at sorting through and evaluating sources. One student said, ‘The more I read, the faster I get at determining whether or not an article is good’. Another student said, ‘I can feel when something is right now… one knows which authors produce a big bang’.

Supporting IL

Several differing opinions were put forth on how the Research School might support the students’ IL. Some students suggested that the library be invited to offer credit-based seminars or courses because then information literacy would be ‘prioritised’. As one student noted, ‘Some novice questions could have been avoided if there had been a seminar’. Another student emphasised that the library should ‘reinstate the course on searching literature and bibliometrics’ because it was ‘really good’. As a contrast,
another student said, ‘Everyone at the Research School is within such different subjects and has such different previous knowledge, that it doesn’t work to learn in a group’.

When asked how the library might better support the students’ IL, the only criticism put forth was that the library should market itself more. Even those students who did not want a specific course said that library support should be made more visible at the beginning of the program. One suggestion was that the library send out introduction letters to new students. Another idea was to give the library a chance to advertise its services in the PhD handbook provided by the school.

Several of the students described the way they learned to search and evaluate information as a self-taught process. When other students were asked whether they were auto-didacts, many could ascribe to this description. One student said that one does not apply to doctoral studies if one is not independent and good at learning on one’s own. Other students said that while they might have learned information searching from a librarian at some point, they have now gone on to create their own unique search method by testing their way forward.

On becoming a PhD student – a period of orientation

One theme that emerged during the interviews was that part of being a PhD student was going through a stage of orientation. One of the students explained that the entire first year of study had been one of ‘fumbling around’ as far as information searching was concerned. When other students were asked to reflect on this comment, many recognised the same feeling of insecurity, but not necessarily about information searching. One student found it challenging to get orientated within a new research field while others found it difficult to find a sense of direction when faced with several new tasks at the same time. In the words of one student, ‘Frustrating to be new. A whole day can go by without me knowing what I did. Lots of hubba bubba’.

On being a PhD student – demands and expectations

Some of the students said that they initially found it difficult to understand the hierarchy of academic culture and that it takes time to ‘understand the playing rules’. Some of the students expressed feelings of confusion and frustration related to the relationship with supervisors. As one student explained, ‘I almost forgot what I thought myself - it wasn’t that important’. Another student said, ‘You put your soul into something and then it is just criticised or even discarded’. 
One of the students said that there is an implicit expectation at the school that PhD students must wear themselves out. Other students mentioned a sort of fluctuating existence, i.e., students have the freedom to schedule their time, but they are ‘never really on leave’. Some students reported feeling stressed due to constant demands to perform despite uncertainty, such as having to apply for research grants to ensure one’s current or future employment.

**Growing into a researcher**

Many of the students described being a PhD student as a maturation process that results in a new role and identity. One student compared the situation to a parent-child relationship. A student must ask a supervisor for permission ‘all the time’, and it is not until the thesis is defended that a student can ‘move away from home’ and become independent. Another student reported feeling more ‘competent and adult’ as a PhD student, while another student said, ‘I feel like a researcher, I feel mature’.

Some of the students seemed to be more accepting of the uncertainty involved with PhD studies. One student noted, ‘Today I don’t get that stressed if I receive three different messages from the same person’. Another student said being a PhD student was a little like having one’s first child, ‘It doesn’t turn out like you expected, you don’t know how to prepare yourself, but it turns out fine after all’.

**Previous experience**

Another point which emerged during the interviews was the role that previous experience can have during one’s time as a PhD student. One student said that it was not such a big step to start doctoral studies when coming straight from master’s studies, since one was used to searching for information and working independently. Another student who had been away from academia for a while said that achieving a balance between family life and work was similar to what doctoral studies demand, i.e., self-reliance and individual goals.

**The PhD supervisor construction**

**Finding information – publication types and search techniques**

The supervisors pointed out that the type of publications that are used by students depend on the tradition around the particular discipline. For example, within nursing or biomedical science, the emphasis is on new research in the form of articles. While within the social sciences, books are considered equally important and there is an added expectation to make
historical connections within the literature. As one supervisor explained, ‘One cannot pretend like something just showed up three years ago. One must be aware of older works, otherwise one can make a fool of oneself’.

The snowball method was brought up as an important search technique by several of the supervisors. One described it as ‘a sort of curiosity technique’. Students are encouraged to keep open and not get ‘stuck in a rut’. Also, a source can seem good at first sight, but on further examination, it may not be at all useful. It is important to go through this process.

One of the supervisors explained that there are two important phases in the information searching of PhD students – at the beginning when they search in order to map the research field and in connection with the summarising chapter of a compilation thesis when they search in order to check that they have not missed anything important in the research area.

**Search competency and getting help**

Many of the supervisors take it for granted that their PhD students can search for information, at least to a certain extent. ‘Some are naturals,’ said one supervisor. ‘I hope they use databases,’ said another, ‘As supervisors, we only make recommendations’. Another commented, ‘There’s a whole lot that one doesn’t know about as a supervisor; I don’t check their homework’. There was one supervisor who did not make this common assumption, ‘We need to freshen up our knowledge as supervisors. We can’t take it for granted that PhD students know what they are doing’.

Another one of the supervisors pointed out that there is a big difference between searching for an empirical study and for a review. For an empirical study, a student only has a few weeks to search and it is enough to only do what is ‘necessary’. In this case, the supervisor should know which are the most important references. For a review, the search is much more comprehensive, and students need to have more awareness of the subject. When asked how students are prepared for this type of searching, the supervisor answered, ‘We have no course on searching for a review, but we try to train them in it’. The same supervisor noted that the role of the library therefore varies depending on the needs of the PhD student. In other words, for an empirical study, it can be enough to have a few hours of consultation with a librarian. For a review, the demands could be more continuous contact and perhaps involving a librarian as a co-author.

In general, the supervisors were very satisfied with the services of the library towards PhD students. One supervisor said, for example, that it was a reassurance to know that they library was there if a PhD student should need help. Another supervisor thought that librarians can help PhD students by encouraging them to search in a different way since librarians have a ‘fresh’ view of how to find new things. Another supervisor said that
it is important that PhD students take the time to search, but at the same time they need to be efficient. ‘They get a little spoiled’. Students need to learn how things work, but under the good instruction of a librarian so that they are not inefficient.

*Information use and evaluation of sources*

In the interviews with the PhD students, it came up that many of them felt more secure in sorting through information the further along they are in their studies. The supervisors did not always agree with this claim. One of the supervisors said that it might be a case of students getting better at their subject, but not necessarily at methodology. Another supervisor noted that some students can be ‘seduced’ by an article that is well-written and not see the flaws in the research.

Another supervisor said that the PhD students who are passionate about their subject can risk losing their objectivity when sorting through sources. A student may have already decided that something is good for people and have a hard time approaching studies in a critical manner or at a distance. Often these students come from working life. ‘A really good PhD student has both work experience and the ability to approach studies with a certain level of distance’.

Another supervisor tried to create ‘emergency exits’ for PhD students by making sure that they collected more data than they needed. In this way, students could go back and re-evaluate if things did not turn out as planned. This meant that both the PhD student and the overall research project were less at risk.

*The concept of IL*

One supervisor observed that information literacy (IL) will differ from person to person based on previous knowledge. Some students bring a lot into the process from the start while for others their abilities grow over time. Due to modern developments such as Google and social media, it is easier to search for information, but that does not mean that students have gotten better at it. Another supervisor also saw the IL of PhD students as depending on background and personality. For example, some students lack basic computer and IT skills while others who are used to searching online (Googling) might find it easier to search in databases.

*Supporting IL*

According to some of the supervisors, instruction in information searching should not be mandatory. It is assumed that information searching is something PhD students can handle, and therefore, it should not be given as an obligatory course, but rather something one can choose as an elective.
One supervisor noted that there was hardly enough space in the curriculum for such a course. Since PhD students start their studies at different times, it also makes it difficult to plan such a course for several students at the same time. ‘You can’t reach all the supervisors and students’. Another supervisor noted that IL is a learning process that is different for everyone, and, ‘Sometimes it’s good to miss the target at first. One needs to work through the fumbling’.

Other supervisors were positive to the idea of a course in how to search for information, and some pointed out that such a course could be interdisciplinary in order to provide the students an opportunity to meet other approaches to research. One of the supervisors mentioned the breakfast seminars for researchers that the library had previously offered as a good example. It was a bonus that the meetings were interdisciplinary and involved several of the Schools. ‘That sort of thing happens too seldom’.

It became clear that support from the library was highly valued, and one supervisor said that activities with the library should be ‘put on the agenda’ more. For one of the supervisors, it was reassuring if students had personal contact with the library early on. Another supervisor pointed out that it is also important to be clear about what the library can offer so that there are not any misunderstandings. As to the question of whether PhD students and supervisors know what the library has to offer, the answer was often ‘no’. As one supervisor explained, ‘There are so many places to check and one doesn’t’.

Some tips on how the library could reach out in a better way included having a page in the student handbook and sending out a newsletter. One of the supervisors said that it is important to provide information about what the library can help with at the beginning, in the middle, and at the end of the PhD process. Another supervisor suggested developing modules aimed at students at different stages of their education and running these every other year at department or PhD-supervisor meetings. ‘Make it visible that it is a process’. One of the supervisors said, however, that more information was not needed but rather more use of the current support. ‘We should take better advantage of the system. One only listens when one needs to’.

One of the supervisors pointed out that as a researcher ‘one cannot be an expert at everything’. Instead, researchers can be experts in their own subjects but bring in experts from other areas as needed, e.g., a statistician for help with more advanced statistics. Another supervisor suggested arranging meetings between the library and the supervisor group now and then, ‘We as supervisors don’t need to know how to do everything. We see you as a resource’. Another supervisor said that from the beginning the PhD students should be able to draw up a plan with their supervisor along the lines of ‘library support during my doctoral studies’.
On being and becoming a PhD student – demands and expectations

One of the supervisors said that there is not anything special about being a PhD student, rather it is ‘an apprenticeship…learning a craft like any other’. Another supervisor noted that there is external pressure on PhD students. Life as a researcher actually starts after one has defended the thesis, but ‘normal people’ often ask ‘What are you going to do now that you are done and have defended your thesis?’ Another supervisor talked about how the situation is a totally new and different for PhD students today, e.g., digital access to publications, navigating open access options.

Previous experience

Some of the supervisors thought they could see a difference between PhD students that had been out working for a while compared to those who came straight from academic life. One supervisor said it can be difficult for professionals to take the time to get acquainted with the academic process since they are used to moving forward and making decisions quickly. Students who come from working life can also be heavily influenced by a pre-understanding, such as clinical experience. Students who come straight from previous studies are often seen as being more comfortable with searching and feeling more at home in academic life.

Financing, control, and community

One of the supervisors brought up the point that there is an important difference between externally and internally financed PhD students. The supervisor further explained that in an internally financed research environment, PhD students work more on their own and the university controls the content more. Moreover, a PhD student might have a supervisor that does not necessarily know the research subject. In an externally financed project, there is more freedom to decide over the content of the research. In other words, a PhD student can develop a research question from the data collection and the framework that already exists, which becomes a positive limitation. Also, this type of PhD student becomes a part of an existing community through regular meetings with the entire research group.

Summary of findings

Information literacy

When it comes to finding information for their studies, the students mainly searched for academic articles. Books were more common within the field of social work. They were also used in general for help with methodology and theory within all fields. Google Scholar was the search tool most often mentioned by students. Otherwise, the tendency was to learn how to search
one database and stick with that strategy. Several of the students and their supervisors brought up the snowball method as an important search technique. One of the supervisors identified two important phases in the information searching of PhD students – mapping out the research field at the beginning and checking that no important resources were missed upon completing the thesis.

Search strategies described by the students varied from simple to more complex. Some students felt they had mastered more advanced techniques, while others reported feeling unsure about their abilities. None of the students reported receiving help in how to search from their supervisors; instead, students said it was taken for granted that they already knew how to search. These assumptions were confirmed in the interviews with the supervisors. Most of the students had been in contact with a librarian during their PhD studies. Students said they knew they could turn to the library for help, but many were unaware of what service and support was available. While they might like to have more help, the students and their supervisors were very satisfied with support from the library in general.

Students who had been studying longer expressed more confidence in their ability to sort and evaluate sources. However, one of the supervisors questioned if students did become better at sorting through sources, especially when it came to evaluating methodology. Another supervisor noted that students who were passionate about their subject risked losing their objectivity when sorting through sources.

None of the students nor supervisors seemed to be familiar with information literacy (IL) as a concept. Further discussions of what IL entails revealed that both students and supervisors saw this as a unique, individual process. Students felt that their IL had developed during their PhD studies, especially when it came to sorting and evaluating sources.

Some students thought the Research School should offer credit-based courses in information-seeking while others felt that it would be too difficult to learn in a group. Many described themselves as being self-taught in how to search and evaluate information. Some of the supervisors said that instruction in information-seeking should be optional, since the assumption is that that students already come to the program with these skills. One of the supervisors thought library instruction could also provide an interdisciplinary meeting place.

Cooperation with the library was highly valued by the supervisors. Students felt that the library should market itself more and make its services more visible, especially at the beginning of the program. The supervisors shared this opinion and one even suggested a personal study plan along the lines of ‘library support during my doctoral studies’.
On being and becoming a PhD student

During the interviews, several themes emerged about what it is like to be and become a PhD student. Students talked about an early stage of orientation, such as ‘fumbling around’ when searching for information or getting a sense of direction when faced with a new research field.

Some of the frustrations that students expressed included understanding the hierarchy of academic culture, freedom to schedule time yet never feeling ‘on leave’, and the expectations of supervisors. Being a PhD student was described as a process of maturing into a new role. For example, one student compared the situation to moving away from home. While one of the supervisors said being a PhD student was like learning any other craft, other supervisors acknowledged the pressure that doctoral studies entails.

As one might expect, previous experience can influence the work of PhD students. Students credited both academic and work life with developing self-reliance. Some of the supervisors maintained that students coming straight from previous studies are often more comfortable with searching and feel more at home in academia, while students coming from the workplace can be heavily influenced by their pre-understanding.

Discussion

As has previously been noted in the literature, the PhD students in this study tended to begin their research on the Internet (Catalano, 2013). At the same time, library e-resources were still considered useful enough to compete with web searches (Carpenter, 2012; Spezi, 2016). In keeping with the common assumption in LIS research (Case & Given, 2016, p. 288), articles from academic journals were generally considered the most important and relevant research publications (Carpenter, 2012; Edwards & Jones, 2014; Grigas, Juzeniene, & Velickaite, 2017; Spezi, 2016), with the exception being those students who were performing research within the field of social work.

The supervisors generally assumed that the PhD students already had the information literacy skills they needed. While some of the students believed they were able to search for information effectively, others said that they were uncertain about how to search. As with previous studies, these students rated their skills as less than adequate and described their information practices in terms of chaos and random approaches to locating information (Carpenter, 2012; Spezi, 2016; Warburton & Macauley, 2014). This period of floundering was most prevalent at the beginning of their PhD journey (Rempel, 2010). The students also described how they found and then ‘got stuck’ with one strategy for searching no matter what they
were trying to find, i.e., only using Google Scholar or PubMed even when other subject databases or discovery tools would be more appropriate. The PhD students in this study also revealed an inclination to consult their supervisors first when seeking information (Carpenter, 2012; Catalano, 2013; George et al., 2006; Green, 2010). At the same time, the PhD students reported how they had managed to develop literacy skills, such as strategically tracking citations, without direct instruction (Green, 2010). Moreover, although the comments made in the interviews about the library and its staff were overwhelmingly positive, both the PhD students and their supervisors stated that they were often unaware of what services and support the library could provide (Carpenter, 2012; Gruber, 2018; Kayongo & Helm, 2009; Saunders, 2012).

This study has its limitations and highlights areas for additional research. As a qualitative study with a small sample of respondents, it is not meant to be representative of all PhD students and their supervisors within the health sciences. Because the constructions were based on self-reported rather than actual behaviour, there is a risk that respondents may have exaggerated their success and use of information sources if they thought this was what the interviewing librarian wanted to hear (Barry, 1995). Further research needs to be conducted in order to develop a more nuanced picture of the information literacies of this user group.

**Conclusions and recommendations**

The purpose of this study was to gain a better understanding of the information literacies of the PhD students at the Research School of Health and Welfare in Jönköping, Sweden. We wanted to know more about their relationship with information during this unique period of researchers in training, so that we can provide the library support they need. During the interviews, the students and their supervisors reported being very satisfied with support from the library in general. However, students faced a troublesome situation with regards to their information literacy development. Students looked to their supervisors for guidance with all aspects of the research process, including information searching and when to contact the library for assistance. Unfortunately, both the supervisors and the students were unaware of the scope of services and support that librarians can provide. Moreover, there was a common assumption among the supervisors that students already had the necessary information skills to navigate their studies, but several of the students said this was not the case. Students were fending for themselves in dealing with the information they needed for research, which often led to inefficient or ineffective strategies.
The findings of this study add to the previous body of work that calls for better collaboration between the librarians and faculty who support PhD students. In addition to continued marketing of library services, suggestions for further practice include more integrated contact with students during the entire doctoral process and research lifecycle (D’Couto & Rosenhan, 2015; Delaney & Bates, 2018; Green, 2010), with a particular focus on the early stages of the PhD journey when students are more likely to struggle (Rempel, 2010) and are still developing their perceptions of library services (Vezzosi, 2009). Because PhD students mainly look to their supervisors for guidance during the transition to prospective researchers, academic librarians would do well to ensure that faculty is not only aware of current library research support but is also part of the dialog to further develop these services.

Acknowledgments

This project was made possible in part by the Institute of Museum and Library Services (RE-95-17-0025-17). We also thank the Research Training Institute of the Medical Library Association for its training, support and encouragement to carry out this research. We thank our library director Mattias Lorentzi for providing us with the opportunity to conduct this project. We are most grateful to the participating PhD students and faculty for contributing their time to our study. We also thank Paola Johansson for valuable comments on the manuscript.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Elisabeth Nylander http://orcid.org/0000-0003-2621-6080
Margareta Hjort http://orcid.org/0000-0003-2364-1313

References

American Library Association. (2015). Framework for information literacy for higher education. Guidelines, Standards, and Frameworks. Retrieved from http://www.ala.org/acrl/standards/ilframework.
Barry, C. A. (1995). Critical issues in evaluating the impact of IT on information activity in academic research: Developing a qualitative research solution. Library & Information Science Research, 17(2), 107–134.
Bury, S. (2011). Faculty attitudes, perceptions and experiences of information literacy: A study across multiple disciplines at York University. Journal of Information Literacy, 5(1), 45–64.
Carpenter, J. (2012). Researchers of tomorrow: The research behaviour of generation Y doctoral students. Information Services & Use, 32(1-2), 3–17.
Case, D. O., & Given, L. M. (2016). *Looking for information: A survey of research on information seeking, needs, and behavior*. Bingley, UK: Emerald.

Catalano, A. (2013). Patterns of graduate students’ information seeking behavior: A meta-synthesis of the literature. *Journal of Documentation, 69*(2), 243–274.

D’Couto, M., & Rosenhan, S. H. (2015). How students research: Implications for the Library and Faculty. *Journal of Library Administration, 55*(7), 562–576.

Delaney, G., & Bates, J., (2018). How can the university library better meet the information needs of research students? Experiences from Ulster University. *New Review of Academic Librarianship, 242*. (1), 63–89. doi:10.1080/13614533.2017.1384267

Edwards, S., & Jones, L. (2014). Assessing the fitness of an academic library for doctoral research. *Evidence Based Library and Information Practice, 9*(2), 4–15. doi:10.18438/B81K5T

Fitzgibbons, M., Kloda, L. A., & Miller-Nesbitt, A. (2017). Exploring the value of academic librarians’ participation in journal clubs. *College & Research Libraries, 78*(6), 774–788.

Fleming-May, R., & Yuro, L. (2009). From student to scholar: The academic library and social sciences PhD students’ transformation. *Portal: Libraries and the Academy, 9*(2), 199–221.

George, C., Bright, A., Hurlbert, T., Linke, E. C., St Clair, G., & Stein, J. (2006). Scholarly use of information: graduate students’ information seeking behaviour. *Information Research, 11*(4), 272.

Glaser, B. G. (2006). *The discovery of grounded theory: Strategies for qualitative research*. New Brunswick, NJ: AldineTransaction.

Green, R. (2010). Information illiteracy: Examining our assumptions. *Journal of Academic Librarianship, 36*(4), 313–319.

Green, R., & Macauley, P. (2007). Doctoral students’ engagement with information: An American-Australian perspective. *Portal: Libraries and the Academy, 7*(3), 317–332. doi:10.1353/pla.2007.0031

Grigas, V., Juzeniene, S., & Velickaite, J. (2017). Just google it’ – The scope of freely available information sources for doctoral thesis writing. *Information Research, 22*(1), 738.

Gruber, A. M. (2018). Real-world research: A qualitative study of faculty perceptions of the library’s role in service-learning. *Portal: Libraries and the Academy, 18*(4), 671–692. doi:10.1353/pla.2018.0040

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Newbury Park, CA: Sage.

Hardesty, L. (1999). Reflections on 25 years of library instruction: Have we made progress?. *Reference Services Review, 27*(3), 242–246.

Ince, S., Hoadley, C., & Kirschner, P. A. (2019). The role of libraries in teaching doctoral students to become information-literate researchers. *Information and Learning Sciences, 120*(3/4), 158–172. doi:10.1108/ILS-07-2018-0058

Kayongo, J., & Helm, C. (2009). Graduate students and the library: A survey of research practices and library use at the University of Notre Dame. *Reference & User Services Quarterly, 49*(4), 341–349.

Korobili, S., Malliari, A., & Zapournidou, S. (2011). Factors that influence information-seeking behavior: The case of Greek graduate students. *The Journal of Academic Librarianship, 37*(2), 155–165. doi:10.1016/j.jacalib.2011.02.008

Kuruppu, P. U., & Gruber, A. M. (2006). Understanding the information needs of academic scholars in agricultural and biological sciences. *The Journal of Academic Librarianship, 32*(6), 609–623. doi:10.1016/j.jacalib.2006.08.001

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, MA: Cambridge University Press.
Nicolini, D., Gherardi, S., & Yanow, D. (2003). Introduction: Toward a practice-based view of knowing and learning in organizations. In D. Nicolini, S. Gherardi, & D. Yanow (Eds.), Knowing in organizations: A practice-based approach (pp. 3–31). Armonk, NY: M.E. Sharpe.

Nylander, E., & Hjort, M. (2020). Information literacies of PhD Students in the Health Sciences: A Review of Scholarly Articles (2009 - 2018). Evidence Based Library and Information Practice, 15(1), 142–158.

Patterson, A. (2009). A needs analysis for information literacy provision for research: A case study in University College Dublin. Journal of Information Literacy, 3(1), 5–18.

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice. Thousand Oaks, CA: Sage.

Rempel, H. G. (2010). A longitudinal assessment of graduate student research behavior and the impact of attending a library literature review workshop. College & Research Libraries, 71(6), 532–547.

Rempel, H. G., & Davidson, J. R. (2008). Providing information literacy instruction to graduate students through literature review workshops. Issues in Science and Technology Librarianship, 53. doi:10.5062/F44X55RG

Saunders, L. (2012). Faculty perspectives on information literacy as a student learning outcome. The Journal of Academic Librarianship, 38(4), 226–236.

Spezi, V. (2016). Is information-seeking behavior of doctoral students changing?: A review of the literature (2010–2015). New Review of Academic Librarianship, 22(1), 78–106.

Sundin, O., Limberg, L., & Lundh, A. (2008). Constructing librarians’ information literacy expertise in the domain of nursing. Journal of Librarianship and Information Science, 40(1), 21–30. doi:10.1177/0961000607086618

Talja, S., Vakkari, P., Fry, J., & Wouters, P. (2007). Impact of research cultures on the use of digital library resources. Journal of the American Society for Information Science and Technology, 58(11), 1674–1685. doi:10.1002/asi.20650

Tuñón, J., & Ramirez, L. (2010). ABD or EdD? A model of library training for distance doctoral students. Journal of Library Administration, 50(7-8), 989–996. doi:10.1080/01930826.2010.489004

Warburton, J., & Macauley, P. (2014). Wrangling the literature: Quietly contributing to HDR completions. Australian Academic & Research Libraries, 45(3), 159–175. doi:10.1080/00048623.2014.928992

Watson, E. M. (2010). Taking the mountain to Mohammed: The effect of librarian visits to faculty members on their use of the library. New Review of Academic Librarianship, 16(2), 145–159.

Vezzosi, M. (2009). Doctoral students’ information behaviour: An exploratory study at the University of Parma (Italy). New Library World, 110(1/2), 65–80.