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Information Literacies in Higher Education: A Swedish perspective

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ABSTRACT

This study aims at a theoretical discussion of what is perceived as a dominating strand in the information literacy narrative. The basis for the theoretical discussion is an empirical investigation of design engineering and nursing students' information use in connection to Bachelor thesis writing. A critical discourse analysis is performed on student theses together with the directives that the students have followed when writing. The theses are also analysed from a sociocultural perspective, with the notion of community of practice and the concept of cognitive authority as complementary tools. An academic discourse is the most prevalent in the nursing student theses. The design engineering students write in another discourse than the expected academic discourse, which poses problems for them. The analysis based upon a sociocultural perspective indicates that information use and thesis writing are used as mediating tools as students strive to form an identity fitting for the community of practice they gradually become members of. It is, furthermore, concluded that information literacy in this setting is an embedded capacity to understand and be familiar with how information is produced, sought, used, and valued in a certain practice.

KEYWORDS

Information literacy, University students, Sweden, Discourse analysis, Sociocultural theory

Introduction

This article concerns information literacy (IL) in higher education. It takes as its point of departure the identification of what is still perceived as a dominant strand in the information literacy narrative (cf. Pilerot & Lindberg, 2011) within higher education, namely to view IL as a set of generic skills attributed to individuals. This is an approach that has been widely criticized, in particular from a research perspective on IL (e.g. D'Angelo, Jamieson, Maid & Walker, 2016, p. 3). Among the shortcomings that have been associated with such an approach is the "standardization" of IL. It has, for example, been argued that "[m]ost IL standards view IL as an attribute of individuals without attempting to account for how individuals interact with others and technical artifacts in their information environments" (Tuominen, Savolainen & Talja, 2005, p. 330). One of the highlighted reasons for why the standards are focusing on individuals rather than communities and social interaction is that they are designed for assessment and for fitting into university systems of grading and progression where the individual is the obvious measurable unit (e.g. Whitworth, 2015, p. 82; Harris, 2008, p. 248).

Despite the fact that the *Information Literacy Standards for Higher Education (IL Standards)*, issued by the US *Association of Research Libraries* (ACRL) in 2000, are approaching its 20th anniversary they are still influential in policy and practice of information literacy: "Widely cited since its formal approval by the ACRL Board, the *IL standards* has seen widespread acceptance by librarians, faculty, administrators, and accrediting bodies" (D'Angelo *et al*., 2016, p. 3). Notwithstanding the publication of the *Framework for Information Literacy for Higher Education* (ACRL, 2015), which supposedly is intended to replace the IL standards, and the criticism that the standards have faced (e.g. D'Angelo *et al*., 2016), they are still referred to as a source of inspiration and support for pedagogical strategies concerning information literacy in higher education. In the context of this article, it is of interest to note that there are Swedish university libraries that continue to refer to the ACRL standards in their definitions and presentations of IL. At the Mid Sweden University, for example, the group of teaching librarians have "chosen to use as starting point [for their definition of IL] the ACRL:s 'Information Literacy Competency Standards for Higher Education'" (Mid Sweden University, 2014).

There is a multitude of contributions to the research on information literacy, which adhere to the stance suggested in this article. It conceives of learning information literacy as developing an understanding of the socio-material and discursive practices in which the learner is active. The emphasis on socio-materiality draws on the idea that social life is "inextricably bound up with materiality" (Orlikowski, 2007, p. 1435), whereas the notion of discursive practice serves to highlight those parts of what people do that involves language (e.g. Talja, 2005). According to this research (e.g., Marcum, 2002; Pawley, 2003; Tuominen et al., 2005; Simmons, 2005; Sundin, 2008; Pilerot and Lindberg, 2011; Pilerot, 2016) information literacy comprises an understanding of, and a familiarity with, how information is sought and used in a certain context. The common denominator for this group of researchers is that their work is grounded in sociocultural theory (e.g. Wertsch, 1998) and that they subscribe to the idea and concept of information literacies in the plural, which indicates that they conceive of information literacy as a phenomenon that varies in character from time to time and place to place. In line with this strand of research, the aim of the article is to present an empirically and theoretically grounded alternative to the standards approach to IL. For this purpose, a small-scale empirical study of the information use of two particular groups of university students is drawn upon as a source of examples and illustrations. The research question addressed is: how can the different ways in which the students refer to information sources be theorized and explained in relation to information literacy education? The two student groups represent, on the one hand, design engineering students and, on the other hand, nursing students. The empirical study is introduced after the subsequent background section, and thereafter used as a reference point for the theoretical discussion.

Background

The following two subsections present the background of the study. The first part identifies a dominating approach to information literacy in Swedish higher education. The second part outlines the ground for an alternative approach to information literacy.

A dominating approach to information literacy in Swedish higher education

Higher education is often presented as the arena where information literacy has been considered the most (e.g. Whitworth, 2015). Within higher education, there is a long-standing tradition of teaching information seeking. In Sweden, the majority of universities have formulated some sort of initiative or mission statement regarding information literacy. These initiatives and statements are often formulated by the university library. It can, for example, be program descriptions and declarations where teaching for information literacy is described and motivated, or it can be web-based tutorials for information literacy, often designed and presented as small courses for students (cf. Sundin, 2008; Schreiber, 2013). Resulting from the so-called Bologna process (Bologna Declaration, 1999), which served to ensure comparability of higher education qualifications throughout Europe, a large number of Swedish university libraries have formulated learning objectives for information literacy. These program declarations, tutorials, and learning objectives contain recurrent formulations and reasoning, which clearly indicate that the work for information literacy in Swedish universities is strongly influenced by similar work in other countries where information literacy is perceived as an important issue. In close vicinity, for example, are North American and Australian (Bundy, 2004) standards for information literacy in which IL is presented as a set of general skills and where emphasis is on information searching – rather than on information use – and on formal information sources such as bibliographic databases and library catalogs (cf. Pilerot & Lindberg, 2011). The following excerpt from the *Information Literacy Competency Standards for Higher Education* (ACRL, 2000) summarizes a view which is also frequently appearing in many of the documents about information literacy published by Swedish university libraries:

> Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning.

In this quotation, information literacy is described as a general competency suitable for all educational contexts. There is also a strong connection being made between information literacy and learning. Through the mentioning of disciplines and educational levels it can be assumed that this learning is supposed to take place in the context of formal education.

There are reasons to dwell upon this issue of learning. The view on IL as a set of skills indicates the idea of learning as an individual activity aimed at conquering knowledge. In this view, learning risks being reduced to a process of reproduction, and teaching to an activity which is about the sending and receiving of knowledge. This approach to learning and teaching is also reflected in texts published by Swedish universities. It is common to find in these documents formulations on information literacy as something academically charged, which primarily is about the ability to search for and manage scientific information. The information literate person must be able to "search for and evaluate knowledge on a scientific level" (Linköping University, 2016); he or she must be "able to demonstrate knowledge about how scientific information is structured and how different types of information sources are organized" (Uppsala university library, 2015); at Lund University, students are supposed to "demonstrate knowledge about scientific communication [and] independently prove the ability to monitor the knowledge development within the area of study" (2014). Knowledge is presented as something that can be searched for and represented. Information literacy is academically charged and perceived as a crucial constituent in a scientific ideal. However, this is not particularly surprising since the rhetoric around the aims and goals of the university at large is characterized by a strong emphasis on the importance of higher education resting upon a scientific basis, and a close connection between education and research (Säljö & Södling, 2006). Regardless of their discipline, students are expected to engage in scientifically grounded studies when they are at university. Not least are they expected to make use of the information resources at their disposal in the university library. Consequently, substantial funds are used for developing physical and digital collections of scientific and academically oriented literature.

In conclusion, it can be claimed that Swedish university students are active in a context where they are expected to develop a general

information literacy primarily aimed at searching and managing scientific information. With reference to the documents accounted for in the previous paragraph, it can be asserted that there is a homogenous information literacy discourse infusing Swedish higher education, that is, a unison way of talking and thinking about information literacy. It is, moreover, likely that this discourse is reflected in the teaching practice in the shape of a uniform teaching for information literacy, which can result in students from different disciplines being offered sessions and courses designed in one and the same way.

An alternative approach to information literacy

The empirical study to which this article refers indicates clearly that it does not necessarily need to be the case that all students are equally scientifically and academically oriented regarding information seeking and use. Students are actually searching for and using information in a variety of ways. In contrast to what is claimed in the quotation above, from the standards produced by the ACRL, where it is stated that information literacy is common to all disciplines, the empirical study shows that disciplinary abode is a decisive factor for how information is searched for and used. In accordance with the alternative approach, information literacy is conceived as a socio-cultural and materially shaped practice, which must be viewed as part of the setting and context in which information searching and use is taking place. The culture of a discipline, including its epistemological assumptions, its specific problems and research questions, contribute to shaping the ways in which information is searched for and used (Pilerot, 2016). This is an idea that is not contained by the dominating approach to information literacy in higher education. According to the alternative approach, information literacy cannot be seen as a neutral set of skills but should rather be seen as knowledge, attitudes and abilities developed in a certain context, for example in a scientific discipline.

The empirical study and the information practices of nurses and engineers

In order to meet the aim of the article an empirical study of students' information use is employed as a reference point and source of examples. The study is not accounted for in its entirety, but briefly

introduced to set the stage for the theoretical discussion. The two groups of students included in the study were chosen because they display a number of similar qualities and conditions. The two groups have had as their point of departure directives that are nearly identical. Apart from general directives formulated at university level and applicable to all study programs at the university, the students have also had to follow program specific guidelines for thesis writing. When examining these documents, it turns out that there are a number of features that are supposed to be included in the thesis. The students – and this applies to both the becoming design engineers and nurses – must use *scientific methods*; be *theoretically aware* and *critically questioning*, as well as *research-based*. For the design engineering students it is especially emphasized that they must *be able to search for information and acquire knowledge* (internal university document, n.d.). In addition to these common starting points, another set of factors common for both student categories can be identified. Similarities occur both with regards to the respective study programs' organization and content. Both programs run for three years and result in a bachelor degree. Apart from resulting in a diploma, both programs are preparatory for further studies on masters' level. Moreover, both programs include the writing of a bachelor thesis. Nursing students as well as design engineering students can be seen as located in the behavioural sciences; both of them express interest in human behaviour as demonstrated by patients, users and consumers in various contexts. This focus of interest entails that the theses produced in the respective programs often communicate small-scale empirical studies of human activities or peoples' experiences or perceptions of various phenomena. One more common starting point is that both cohorts of students have taken a credit bearing course entitled *Information literacy* which is aimed at information seeking in an academic context. The aim of the course is to "convey how and where different types of information are sought and how one is supposed to prepare for information seeking [and] how one critically assesses and values information" (internal university document, n.d.).

The aim of the study referred to in this article was to explore how students that are heading for these professions use information, and also to shed light on the reasons for the occurring differences in information use. The study was conducted through investigating how

the students use information in connection to the writing of bachelor theses. In addition to student theses produced within two study programs, the empirical material consisted of a document containing directives for thesis writing. The latter was issued by the university's research and education board and forms the basis for how nursing students as well as design engineering students are supposed to write their theses. Eighteen theses, nine from each program, were selected for analysis. In order to present a view of the students' information use during a certain time period, the selection criteria was that the theses were produced during one and the same year.

The focus of the present article is on the qualitative analysis of the student theses, but this analysis should be seen in the light of a reference analysis that was conducted on the eighteen theses. The act of citing is often conceived as primarily concerning an individual and cognitive activity (Nicolaisen, 2003). In this study, however, citations are understood as embedded in the conventions of academic disciplines. The notions of references and citations are sometimes used interchangeably. An early suggestion for how to distinguish the two was presented by Derek de Solla Price (1970) who stated that

> /…/ if paper R contains a bibliographic footnote using and describing Paper C, then R contains a *reference* to C, and C has a *citation* from R. The number of references a paper has is measured by the number of items in its bibliography as endnotes and footnotes etc., while the number of citations a paper has is found by looking it up on some sort of citation index and seeing how many other papers mention it (Price, 1970, p. 3).

The reference analysis in the study drawn upon in this article adheres to this distinction. Accordingly, in order to establish to what extent the students refer to information sources, all items in the reference lists were counted, and the types of sources were examined (see table 1).

	Nursing (n=9)	Design (n=9)
Monographs	96	29
Peer-reviewed articles	**108**	**1**
Web sites	11	44
Other sources *	31	30
Total number of refs.	246	104

Table 1: distribution of references in 9+9 student theses

** = E.g. Course material, Daily newspaper articles, Product catalogues*

Of particular interest regarding the reference examination was to see if there were differences in the use of academically oriented information such as peer reviewed journals, academic dissertations, and other research communication. This investigation of references clearly demonstrated that the nursing students are referring to academically oriented information to a far greater extent than the design engineering students.

The connection between the students and their teachers

In common for both student categories is thus that they have to follow and pay attention to directives and guidelines, that they have gone through a preparatory course in information seeking, and are subsumed into a range of unspoken assumptions and conventions, which to a varying degree are grounded in the idea that students should search for and use scientific information in a similar way regardless of disciplinary abode. It can thereby be established that the students are entering into their respective disciplines in which they are, through their studies and through interaction with peers, cultivated to become members of a community of practice where the common denominator is the participants' common care and nurturing of the disciplinary subject domain (cf. Wenger et al., 2002, p. 27). This takes place through interaction with the already existing participants, namely the teachers and lecturers. In this case, the students' teachers are people that either have a background in the professional field that the students are preparing for, or have years of studies in the subject area; in some cases both. Against this background it is of interest to apply a broad perspective on how information is searched for and used in the respective disciplines. Consequently the next subsection briefly outlines the information practices of engineers and nurses.

The information practices of engineers and nurses

Engineers are frequent information users but they are mostly using easily accessible information of a non-scientific type (Case, 2016, p. 279). According to Pinelli (2001) and Vincenti (1990) there is an "engineering community" which they describe as an arena for informal exchange of the sort of knowledge and information that contribute to shaping a common professional identity. Sundin (2003) identifies two prominent views on information seeking and use within the nursing profession. On the one hand, there is the group which briefly can be described as consisting of newly graduated and other nurses in the vicinity of academia where the nursing theoretical perspective is dominating. These are generally positive towards the seeking and use of scientific information. It is reasonable to also include the nursing students' teachers in this category. On the other hand, there is a group occupied by nurses with long professional experience and with diplomas from an older kind of training program. This group is characterized by a medical-technical stance to nursing work, and is generally not as keen on the searching for and use of scientific information. Articles from the field of design engineering research, which are describing the information practices of design engineers, are characterized by a normative trait, which prescribes the use of scientific information in design engineering practice (e.g. Court, 1997; Restrepo & Christiaans, 2003; Skepper, Straker & Pollock, 2000). This trait can be compared to the nursing profession's effort to communicate norms, values and awareness of the importance of scientific information for the nursing profession. Even if it is not necessarily the same ambition, to maintain a professional project, which Sundin (2003) suggests is the case among nurses, both groups are striving in the same direction, i.e. there are voices in both of the professional groups who are encouraging colleagues to search for and use information of a certain type and in certain ways.

In line with the suggestion that reference analysis should be complemented with qualitative analysis (e.g. Garfield, 1997), the following section of the article introduces the theoretical starting points for the qualitative analyses. On the basis of the introductory reading of the eighteen theses, one representative thesis from each program was selected for qualitative, textual analysis, which was thus performed on the directives and one thesis from each study program.

Theoretical starting points

The qualitative analysis of the two representative theses was inspired by Norman Fairclough's critical discourse analysis (CDA) (e.g. Fairclough, 1992, 2003) which comprises three analytical levels. The analysis conducted on the first level has a clear linguistic focus on the text. Here it is of interest to study phenomena such as choice of words, modality, intertextuality and the general structure of the text. The second level concerns what Fairclough terms the discursive practice. On this level, the analysis is concerned with issues related to the circumstances of production, consumption and the distribution of the theses. Who are the authors? For whom are they writing? Along which ways do the texts find their readers? At the third level of analysis, where the social practice in which the theses are produced is in focus, interest is directed towards how (and if) activities such as information use can be perceived as institutionalized and socially anchored.

In order to further increase the understanding of the social practice and the information use activities of the theses writers, a socio-culturally oriented analysis was conducted. In accordance with such a perspective both thesis writing and information use are considered as mediating tools (Wertsch, 1998; Säljö, 2011), i.e. as common resources that the students make use of in order to manage knowledge in their respective domains. A particular feature of this socio-cultural perspective is Etienne Wenger's (1998) notion of communities of practice, which was used for theorizing the students' learning of information seeking and use as social participation. For the purpose of reasoning about the role of the teachers in these communities of practice, Patrick Wilson's (1983) concept cognitive authority was applied.

Discourse analysis

The third level of discourse analysis, which focuses on the social practice of the students, offers a link to the analysis from a socio-cultural perspective, but this was preceded by the linguistically oriented analysis. Apart from discerning a number of main features, where focus has been on aspects such as choice of words and the structure of the theses, it has also been of interest to study *how* or in *which ways* the authors have expressed themselves concerning various

subjects dealt with in the text, that is, aspects related to *modality*. The analysis has also concentrated on the tracing of intertextuality, how the text can be seen as related to other texts. In summary, it can be said that the analysis, through the use of carefully selected excerpts, has been conducted through close reading of the texts in order to examine and to demonstrate how the texts "speak", which situations and contexts they are moving towards, how words and phrases become filled with meaning, and how the theses relate to other texts.

Regarding discursively oriented approaches, Talja and Mckenzie (2007, p. 99) are highlighting that these:

> […]often require fine-tuning to match the topic and setting studied. Much of the pattern and orderliness made identifiable and observable by the researcher has initially become understandable inductively, as the researchers slowly recognized and gained s sense of distinct recurrent patterns of talking and sense making in the institutional or everyday life setting studied.

The method described in this quotation fits nicely with how the empirical material in this study has been examined. The more readings of the documents, the clearer discursive patterns have emerged. Already in an early stage of the close reading of the documents, discourses have been possible to identify. The analyses have thereafter been focused on elucidating the discursive structures of the texts.

In order to provide examples of how the text-based analyses were conducted, the next section contains a presentation of the analysis of the steering document. The structure of the subsequent section follows a pattern that contains introductory theoretical reasoning followed by analytical examples. This pattern characterizes the whole analysis section. Since discursively oriented studies to a great part build upon analyses of texts it is of importance to provide examples in the shape of quotations where choice of words and formulations signal how discourses are emerging. However, all quotations and formulations that could have been pointed at in order to identify the prominent academic discourse (cf. Bazerman, 1981) in the steering document have not been represented here. The selected excerpts are functioning as illustrative examples of how this discourse is emerging. Finally, before entering into the steering document, it should be mentioned

that one and the same text may very well contain several, and in some cases competing, discourses (Talja, 1999). Accordingly it is possible to discern in the steering document another discourse than the academic. Even if it does not appear as strongly, it is possible to also identify a market economical discourse (cf. Fairclough, 1993).

Analyses

The following subsections present a series of analyses where the first analysis concerns the steering document that the students were supposed to adhere to. This is followed by a set of analyses of the student theses.

Analysis of the steering document

The twelve page document is structured in accordance with a number of headings that relate to formal, content related, and procedural aspects of thesis writing. The discourse, which has been labelled the academic, is expressed in passages of the following kind:

> The aim of the thesis work is to provide the students with the opportunity to specifically develop their *critical thinking abilities* and to exercise *independent problem-solving and problem formulation of a research and development character* [author's italics].

In order to be successful in their thesis writing, the students must have:

> […]satisfactory general orientation in scientific approaches and methodology, and in their particular subject's theory and method formation.

In the bullet list that describes what the supervisor is supposed to engage in, it is expressed, among other things, that this person must "provide advice on suitable scientific methods" and "provide ideas for theories and suitable literature". The student, on the other hand, is expected to "study the theories and the literature that the supervisor has provided". It is also stated that the thesis must be "based on a precise and relevant problem formulation which is addressed by scientific methods which are demonstrating a certain sense of generality". Furthermore it is concluded that "the thesis must be authored according to prevailing demands on scientific presentations"

In relation to the heading *Research connection*, which in itself can be seen as an expression of an academic discourse, the following question is posed:

> To what extent does the student relate their thesis work and their problems to previous research? Does the author connect the work to other studies in the subject area? Is the thesis work more to be seen as an isolated product which is not located in a scientific context?

When the market economic discourse from time to time emerges, it is often in relation to the mentioning of a perceived threat against the academic discourse. There is, for example, a warning expressed that "the norm system of the University for assessing the educational achievements" risks "giving in for shortsighted demands that the thesis work should take the character of a simple investigatory work". Also the risk that the thesis work assumes the form of an "isolated product" or of "consultancy" is expressed.

To sum up, the analysis of the steering document shows that the students are expected to produce theoretical and scientific theses that are grounded in previous research – briefly put, in a traditional sense, academic texts. The analysis of the steering document constitutes the background against which the two student theses are read.

Analysis of student theses

After having conducted text based analyses of the kind that was carried out on the steering document, three discourses have been identified in the student theses: an academic (cf. Bazerman, 1981), a market economic (cf. Fairclough, 1993), and a technological discourse (cf. Gherardi & Nicolini, 2000). The academic discourse dominates strongly the nursing students' theses, whereas the design engineering students' thesis work is characterized by the two latter discourses. The discourses are identified through observations of choice of words, the use of metaphors, and modality. Since the proceeding reading of the texts, which is focusing on discursive and social practice, takes as its point of departure examples from the linguistically oriented analysis, there will be examples provided in the following of discourse markers, that is, features in the texts that are signaling which discourse that is prominent. It can, however, be mentioned that the dominating market economic discourse in the design engineering students' theses, for

example, is manifested when the authors are mentioning instances such as a "customer perspective" (and not a user perspective) and "market segment". When they are referring to the work they are conducting, the actual thesis work, they start out by referring to it as their "final work", but more often they use terms such as "commission" or "project". The first of these two is not as farfetched as it may seem since the students have carried out their work in liaison with a commercial company, which in itself can be seen as an arrangement that contribute to locate their work in a market economic discourse.

Like the design engineering thesis, which immediately invites the reader into a market economic discourse, the reader is quickly realizing when reading the nursing thesis that it is characterized by an academic discourse, and therefore clearly resembles the academic tone that infuses the directives. Apart from the structure that is recognizable from publications in most disciplines within the social sciences, with clearly expressed research questions, an explicit aim, and with specific sections for theory, method, and discussion, there are also accounts for which literature that has been retrieved and for how it has been made use of. The term "scholarly article" is explicitly mentioned. Like in the steering document, the importance of a "critical stance" is emphasized in the nursing thesis.

Analysis from an order of discourse perspective

In accordance with CDA the identified discourses taken together constitute the order of discourse in which the thesis writing students are active. Fairclough (2001) explains that

> An order of discourse is a social structuring of semiotic difference – a particular social ordering of relationships amongst different ways of making meaning, ie different discourse and genres and styles. One aspect of this ordering is dominance: some ways of making meaning are dominant or mainstream in a particular order of discourse, others are marginal, or oppositional, or 'alternative' (p. 232).

The quotation emphasizes the aspect of order of discourse that concerns dominance: within an order of discourse one, or a few, particular ways of creating meaning is dominating. It is thus reasonable to suggest that a power infused relationship between

discourses is appearing in the order of discourse. The conduct of power within the order of discourse can take at least two different forms: through the establishing of rules, norms, and conventions, which Fairclough (1992) expresses as a "[…] model of discourse, which sees discourse in terms of the instantiation of codes with strong framing and classification […] and a highly regimented, normative practice" (p. 95). This kind of power conduct is in contrast to the kind of conduct that takes the shape of a hegemonic version, that is, the kind of power conduct which certainly is linguistically articulated but not codified through precise rules and directives. In the present case it is possible to see the steering document as an expression of codified power conduct. The hegemonic version is of a more subtle kind. It can, for example, be manifested in the language use of a teacher, where this person consciously or unconsciously linguistically articulates a certain discourse through the choice of words, expressions and metaphors. Another example of the hegemonic version could be that a collection of produced bachelor theses articulate a certain discourse. If this production influences how future students write their theses, it is possible to speak in terms of hegemonic power conduct.

If the order of discourse is understood as the area of higher education, as this area is manifested within a certain university, that is, as "[…] a particular social ordering of relationships amongst different ways of making meaning […] (Fairclough, 2001, p. 232), then a power infused relationship can be discerned between the identified discourses: the academic (manifested in the steering document and in the nursing theses) and the market economic and technological (manifested in the design engineering theses). Not least through its traditionally strong standing, the academic discourse is in hegemony. It is manifested through ways of talking and writing, but also as codified power through rules and directives and explicit norms. Regarding the latter, the steering document can be seen as an example. In addition, it can also be noted that Fairclough emphasizes that the "code-model" is highly institution oriented.

Analysis of the discursive practice

The analysis of the discursive practice is to a certain extent leaving the theses but without completely letting them go. Texts are produced and consumed during certain circumstances. The production and

consumption of texts is related to the prevailing discursive practice where texts are produced and consumed (Fairclough, 1992, p. 78). Text production and consumption can be either individual or collective in the sense that some texts obviously are aimed at one specific individual and where the producer is one, specifically defined, individual – for instance the love letter (Ibid.) – whereas other texts are aimed at extensive collectives and where the producer is far more anonymous or collective in nature, which is, for example, the case with legal texts. The ways in which texts are distributed can also vary. One example of a text with a simple form of distribution is the everyday conversation which only relates to the situation in which it takes place. On the other hand, there are also texts with a complex form of distribution such as the political speech, which indeed is consumed by the listeners in the place where it is given, but it can also find its way through further channels like mass media and history books and thereby also reach other consumers. When the discursive practice has been examined in this study, interest has been concentrated on issues related to for whom the students are writing; if they write in pairs or individually.

It is of interest to note that when the student theses are finished and examined, they are immediately distributed to the university library, where they are becoming an object of great interest for students who are approaching the stage in their programs where they are supposed to write theses. When many active thesis writing students are borrowing many finished and published theses, which is the case in the present study, it is possible to point at a reproductive aspect in the students' work: for the students to know how they are supposed to write their theses, they study other student theses. It can thereby be concluded that there is an upholding force at place that leads to a preservation of the way in which students write their theses in the respective study programs.

In connection to the analysis of the discursive practice, and in particular in relation to the distribution aspect being elucidated, it becomes of interest to address the students' purposes for writing theses. The immediate purpose is likely to be that the students want to graduate and finish their study programs. A more extended purpose can be to accomplish a text that can be used for proving that the author has developed certain abilities and a certain knowledge, which

can result in a specific position as an employed professional. In the latter case, the distribution network has become extended and found its way outside of the academic order of discourse.

Furthermore, when dealing with the thesis writers' discursive practice, a connection can be made to the previously mentioned text by Pinelli (2001). He refers to the highly cited study by Allen (1977) and concludes that engineers (in contrast to scientists) are not primarily consuming information in the shape of texts for the sake of producing new texts:

> […] the difference between engineers and scientists in terms of information processing becomes apparent upon examination of their outputs. Scientists use information to produce information […] engineers use information to produce some physical change in the world. Engineers consume information, transform it, and produce a product that is information-bearing; however, the information is no longer in verbal form (Pinelli, 2001, p. 136).

This difference also appears when examining the student theses. Especially through the linguistic analysis of the design engineering students' theses, which clearly show that the development of a product is in focus whereas the nursing students' ambition rather is to produce a text, where theories and abstract reasoning is placed at the fore.

Analysis of the social practice

Fairclough (2003, pp. 25) describes social practice as constituted of three elements: I) *ways of acting*, for example through talking and writing; here he also introduces the concept of genre: different social practices make use of different genres. An example of a genre in line with the present study could be the student thesis. The second element of a social practice concerns II) representation, in the sense of linguistic representation, depiction, mentioning. People in different social practices can talk of the same phenomena but communicate different content and meaning. The third element, III) style, appears alongside bodily behaviour and constitutes particular ways of being, particular personal or social identities. The example provided by Fairclough is "managers" who use their language as a resource for identity formation.

Regarding the first element in the constitution of social practice, ways of acting or genre, it can be asserted that the differences that the linguistic analysis identified between the two student categories' theses indicate different genres: on the one hand, the academic thesis, on the other, the technical report. Regarding the second element, representation, the text analysis showed that the authors subscribe to different ways of referring to and representing reality. A clear example is that which concerns the term "method", which is assigned different meaning in the respective theses. In both of them there is reasoning around methods, but whereas the design engineering students attribute the term with content that implies something which seems to refer to practical accomplishment, the nursing students seem to refer to content related to abstract considerations and theoretical reasoning. With the third element of style as starting point it seems reasonable to view the thesis writers' distinct discursive expression as an unconscious but still identity preserving tool: through writing and using (or not using) information in accordance with how one expects a thesis to be written, and information to be used, in the discourse to which one is located, the discursive identity is maintained and strengthened.

The analysis of the students' social practice connects to an explication of the sociocultural perspective that is taken in the study.

Analysis from a sociocultural perspective

The purpose of sociocultural theory is to make visible the relationship between activities and action *and* the context in which the activities and actions take place (Wertsch, 1998, p. 24). This is a purpose that is in line with the parts of Fairclough's discourse analysis, which focus on discursive and social practices, and where the object of the analysis is the context in which the theses are written.

A central concept in sociocultural theory is that of *mediating tools*, a concept that refers to the intellectual or physical resources that people have at their disposal for understanding and acting in the world (Säljö, 2000, p. 20). To a certain extent it may seem as if the students have conducted one and the same task but, as observed by Wertsch:

> In certain important respects, an action may be the same, but the systematic organization of agent and cultural tool often ends up being quite different, indeed so different in

> some cases that controversy emerges as to whether or not the same action is being executed (Wertsch, 1998, p. 46).

It can be argued that the above quotation suggests that one and the same mediating tool can be used for one and the same purpose, in this case for thesis writing, but still result in quite different "end products". Even if the steering document is not the only directive that the students have to follow, it still constitutes the formal base for how the students are supposed to accomplish their work. Seemingly one and the same tool has been introduced to both of the student cohorts, but their respective communities and the prevailing discourses are so different that it becomes reasonable to question whether they actually have conducted one and the same task. When students are studying and writing in different communities of practice, the result of their tool use – the theses they write and the information they use – also becomes different.

One of the most central mediating tools is language. James Wertsch is quoting the Russian linguist and literary scholar Michail Bakhtin who refers to words in language as partly belonging to someone else:

> It becomes "one's own" only when the speaker populates it with his own intention, his own accent, when he appropriates the word […]. Prior to this moment of appropriation, the word does not exist in a neutral and impersonal language […], but rather it exists in other people's mouths, in other people's contexts, serving other people's intentions: it is from there that one must take the word and make it one's own (Bakhtin, 1981, p. 293, cited through Wertsch, 1998, p. 54).

The above quotation supports the idea that students use, or take their language from, the discourse that they are part of. Introduced here is also yet another central concept in sociocultural theory, namely *appropriation*, which can be described as the process of taking something which belongs to someone else and making it into one's own (Wertsch, 1998, p. 53).

Communities of practice and cognitive authorities

The socio-culturally inspired concept of communities of practice, as well as the concept of cognitive authority, should also be introduced here. An example of a community of practice is that which consists of

teachers and students in a certain discipline, who are caring for a common domain of knowledge in the shape of a certain course or a certain subject and where a common practice is developed in order to be effective in the domain. In this context, the teacher can be described as a cognitive authority, i.e. someone who the students think it is worth listening to since it seems as if (s)he knows what (s)he is talking about (Wilson, 1983, p. 10). Accordingly it is reasonable to expect that students adopt, for example, the ways their teacher is searching for and talking about information. A central idea in Wilson's work is that the value of knowledge to a great extent is a social construction. To decide if certain knowledge is valid or not we need to find out how it is perceived by those who are active in the context where it is supposed to be valid. It is not enough that the knowledge in question is instrumental, i.e. that it is practicable when solving actual problems. That which is worth knowing must also be seen as valuable knowledge by others. According to Wilson:

> What one needs to know also depends in part on what others expect one to know. […] What can be ignored and what must not be ignored are matters settled by collective agreements (tacit or overt) as much as, or more than, by the actual indespensability or dispensability of knowledge to performance (Wilson, 1983, p. 150).

A consequence of this line of reasoning is that it becomes important for the students to pay attention to what they think their teacher think they should know. Regarding the relationship between teachers and students, Wilson asserts that the student "is to develop a taste consistent with those of the teachers, and it is not frowned upon for the student to take the teacher as a model whose taste is to be emulated as far as possible" (Ibid., p. 66-67).

An example that emerged from the linguistically oriented text analysis was, as mentioned previously, the writers' use of the term "method". Referring to the Bakhtin quotation, where it was stated that a word partly belongs to someone else, one can conclude that the word "method", as it is assigned meaning by the design engineering students, partly belongs to a market economic discourse and a technologically oriented discourse. It thus serves a purpose that is central to the community of practice of design engineering students

and their teachers. The nursing students' use of the same term shows that in their community of practice, it is assigned a different meaning, which serves the purpose that is central to their nursing theory-infused and academically oriented community of practice. However, it is not only language in itself that is being appropriated, but also the adoption of the mediating tool of thesis writing, including the citing practices and the use of certain information sources. Accordingly it makes sense to perceive the thesis writing students as appropriating that mediating tool which is the writing of the thesis.

By adopting the mediating tool, the students show that they master the discourse, which prevails in the community of practice where they are active. Thus far it can also be claimed that the use of mediating tools embraces several dimensions. Students do not write theses only in order to address the problem that they have decided to solve – the way in which a thesis is written can also be a way for the author to show that the (s)he is someone to be counted on in the context where (s)he is active. This line of reasoning can be illustrated with an example from the analysis of the nursing students' thesis. The authors mention that they have used the bibliographic databases CINAHL and MEDLINE – two scientifically oriented, well-reputed and for the subject area central resources which are charged with cognitive authority. The students are using the databases as information sources, but also as discursive markers which signal that the authors have made themselves at home in the prevailing discourse, and that they are capable of identifying the cognitive authorities of their community of practice. This is also reflected in the nursing students' relatively comprehensive referencing of academic information sources (cf. Table 1).

In contrast to the nursing students, the design engineering students encounter a problem here, which concerns what is expected from them, and which indicates a certain inconsistency: on the one hand, they must adhere to a certain discourse – the tool at their disposal is colored by the discourse in which it is developed – on the other hand, and at the same time, they are also within the frames of an academically oriented order of discourse, which calls for attention and demands from the students something which does not fully fit with the market economic discourse and the technologically oriented discourse. The field of tensions where they are active can be described

as situated between, on the one hand, an educational program of academic character, where they are expected to make use of academically oriented sources of information and, on the other hand, a community of practice which is strongly characterized by a market economic and technologically oriented professional practice where these kinds of information sources are of less importance.

Concluding discussion

In the opening of this article, it was asserted that higher education in Sweden is infused by a homogenous information literacy discourse, i.e. a uniform way of talking and thinking about IL, which has been historically and socio-culturally shaped by the scientific ideal that characterizes higher education in general. However, the study presented here shows that students in different disciplines seek for and use information in different ways. The nursing students' information use seems primarily to be geared towards the production of academically oriented texts in accordance with the instructions presented in the steering document. Their work is thus manifested through the genre of academic thesis writing where the prime purpose is to formulate scientific arguments and generate new theoretical knowledge. The design engineering students on the contrary are mainly using information in order to develop and design a material object. Their genre is more akin to the technical report. Consequently it is problematic to expect from the design engineering students that they, to the same extent as the nursing students and in line with the steering document, will relate to previous research and other studies in their subject area.

Compared to the design engineering students, the nursing students are in general referring to a larger amount of scientific information. In line with what was previously stated in this article when reviewing the literature on engineers' and nurses' information practices, it can be concluded that there is a striking similarity in the respective disciplines between students' and professionals' information practices. Like professional design engineers, design engineering students seem to be rather moderate users of scientific information of the kind that is common in an academically oriented discourse. Similarly, there is a connection between the perception of information seeking and use

displayed by, on the one hand, professional nurses with a recent education or who are in the vicinity of academia and, on the other hand, nursing students. The socio-culturally oriented analysis supports this result: already during their studies, students seem to become socialized into an information practice which shares traits with the information practice that is prevailing in the profession they are heading for. Their teachers, in their capacity as cognitive authorities, can thus far be seen as links between educational and professional practice.

That the design engineering students do not seek and use as much scientific information as the nursing students does not mean that they have not developed information literacy. It does however indicate that their information literacy is of another kind. The study shows that it is problematic for those students who are active in another discourse than that which is hegemonic in the order of discourse; a discrepancy emerges between what is expected from them and the content that they are being exposed to through social participation. This result can constitute the ground for a discussion of the dominating understanding that information literacy is common to all disciplines.

The result can also be seen as an argument in favour of the alternative, socio-culturally oriented perspective on information literacy, according to which teaching for information literacy should be embedded within the curriculum. From this perspective, teaching is beneficial if it is adapted to the discourse that prevails in the community of practice where the students are active. Even the expectation on this teaching and the ways in which it is presented is preferably based in the discourse that characterizes the students' community of practice, and not necessarily in a thoroughly academic discourse. In extension of this line of reasoning, it seems reasonable to suggest that the design engineering students' thesis writing should adhere to instructions that are not primarily characterized by an academic discourse. It can also be concluded that learning objects for information literacy that are too general may hinder certain groups of students to develop information literacy.

With reference to the results of this study it can also be suggested that for librarians who teach for information literacy, it is worth aiming at becoming more than peripheral actors in the communities of practice where the teaching is going on. A more central position in the

community of practice can contribute to an arrangement where the teaching librarian is seen as a cognitive authority by both students and teachers. The results furthermore indicate that it is important for librarians to realize that disciplinary subjects are discursive, or linguistically charged, in character (cf. Simmons, 2005). It thus becomes necessary to understand that being knowledgeable within a certain discipline includes the ability to master the prevailing discourse and the intellectual and physical tools that are used within the discipline. In other words it can be concluded that familiarity with discipline specific ways of using tools such as information use and thesis writing, as well as insight into the disciplines' discursive character, is a prerequisite for successful teaching for information literacy.

It also seems reasonable to emphasize learning that goes on outside of formalized teaching for information literacy; and to pay attention to the notion of communities of practice when developing strategies for information literacy. Students write different theses and use information sources in different ways even if they work under seemingly similar conditions, including the same directives and preparatory information seeking courses. In accordance with a sociocultural perspective on learning, they develop information literacy to a great extent through participation in communities of practice and, perhaps to a lesser extent than what the organizers of the education expect, through formalized and standardized information literacy training.

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