

Searching as a learning activity in real life workplaces

Katriina Byström
Oslo and Akershus University College
of Applied Sciences
NO-0130 Oslo, Norway
+47 67 23 50 00
katriina.bystrom@hioa.no

ABSTRACT

In this position paper, I will argue and exemplify how three conceptually separable, but in practice always intertwined dimensions – social, individual and techno-material – relate to and illuminate different aspects of searching as a learning activity. The paper builds on a conceptualization of searching as a part of something else, like a work task rather than an activity making sense on its own. Social dimension emphasizes shared (work) practices, individual dimension addresses personal characteristics that affect how work is performed, and techno-material dimension focus on system properties. Searching as a learning activity is related to each of these dimensions. The dimensions offer a novel conceptual and methodological platform for studying searching as a learning activity in real-life work tasks, and embed searching as a learning activity into a wider frame of workplace learning.

Categories and Subject Descriptors

-

General Terms

Human Factors, Theory

Keywords

Information seeking, Information searching, Practice theory, User studies, Work tasks, Workplace learning

1. THEORETICAL POSITIONING

Learning, like use of information, is an elusive phenomenon which is constantly present in human life. Besides formal educational contexts learning takes also place in the workplace; sometimes in formally organized events, but often informally and nearly unnoticed in everyday work tasks. Like in many other contexts, there is a social dimension of learning along with individual and techno-material dimensions in such mundane activities. In this position paper, I will argue and exemplify how these dimensions readily relate to and illuminate different aspects of searching as a learning activity.

To demarcate the scope of this paper, a present definition of searching as a learning activity needs to be discussed in some detail. My starting point is a common and broad view on learning as a process of gaining knowledge of some kind; may that be

ideas, facts, insights, skills, understandings or something else. Searching on the other hand, may be specified in somewhat more precisely as an activity in relation to information seeking in a work task context: “whereas information seeking tasks focus on the satisfaction of an entire information need (consisting of different types of information, subject topics, etc.) through – often several – consultations of channels and sources, information search tasks focus on the satisfaction of a separable fraction of an information need through a single consultation of a source or sources; a task performer searches for information from one or more sources during one consultation process or search episode” [2, p. 1056]. This definition accommodates accessing several kinds of information, mediated digitally as well as in other ways. In this paper, searching as a learning activity is then seen as an activity to be learned in itself as well as an activity carried out for learning purposes. In both cases, learning may be an explicit goal or it may take place indirectly as a part of attending to work tasks. The paper relies on current theoretical development in LIS on the fields of information behaviour and interactive information retrieval, borrowing ideas from organizational learning research, and more generally from sociology and educational sciences.

My discussion builds on the nowadays widely accepted conceptualization of searching as a part of something else, like a work task – rather than being seen as an activity making sense on its own. This presupposition suggests that even when searching is the focus of study, it needs to be framed in its context. In this position paper, I aim to provide a conceptual and methodological platform and an initial set of research topics for studying searching as a learning activity in real-life work tasks. This approach differentiates searching beyond types of search tasks and even types of work tasks, and demonstrates the multidimensionality of searching in workplace learning. To my knowledge, this is a novel attempt to understand searching in relation to workplace learning.

In order to introduce and explain the social dimension of searching as a learning activity, a practice theoretical standpoint is taken. I lean towards the work that I am presently involved with Annemareé Lloyd [2], where Schatzki’s practice theory [cf. 11] plays a central role, but where ideas from especially Giddens’ structuration theory [cf. 4] as well as Engeström’s activity theory [cf. 7, 14] are influential. This dimension emphasizes that work and the context where the work is happening outline the boundaries, and that they guide and regulate what requirements, procedures and solutions are suitable in carrying out a work task and arriving at a result. The sociality of any work activity mirrors learning in general; a person learns how to be a worker of a

specific field in a specific workplace through participation, for instance how to be a university professor (professional practice) at Oslo University (local practice). Since other persons as well as material and intellectual objects in the work environment carry with them traditions, values and an agreed-upon set of facts, this learning is attached to the trajectory of time – happening now, but inescapably relating to the past. In the process of learning, a person becomes not only an able worker in her setting, but also an active participant of the practice(s) involved; mediating and developing the traditions, values and facts further.

Relating to searching as a learning activity within the social dimension, the search strategies and goals of the searching are viewed as a part of the work practice(s). There is a push in any work practice to look for certain information (and ignore others), to use certain ways of getting hold of it (and ignore others) and to utilize certain information sources (and ignore others). In most workplaces, the most conventional information sources are made readily available in order to make the work flow effectively. They are part of the activities learned in relation to general and local work practices. Thus, a work task and searching as a part of it – whether performed by a single person or in co-operation – is never an activity in solitude, but related to other current and past doings and people in the workplace.

Turning to the individual dimension of searching as a learning activity, I am approaching the perspective from mainly LIS oriented literature, where the user's capabilities, skills, motivation and prior knowledge has been focused on in several studies [cf. 6, 10]. However, even here the individual is seen as participating and interacting in her social context, although the emphasis is not on socially construed relationships directly, but on the ways that these relationships are re-formed through individual human attributes. Such attributes may refer to personality traits, knowledge, experience, interests, motivation, idiosyncrasies, habits, preferences, situation-sensitiveness and other such things that make a difference between individuals, even if they share certain social practice(s). Accordingly, a person may choose a particular approach or goal for personal development when it comes to her work tasks. These, conscious or unconscious choices of an individual, clearly relate to her learning in general and consequently affect searching as a learning activity. This makes a work task performance including searching, sensitive to individual attributes; for instance, we know that people with good motivation are looking for divergent information and utilizing a variety of information sources than less ambitious people in learning tasks [cf. 9].

Finally, the techno-material dimension concerns not only information systems, but norm structures, regulations [cf. 8] and material objects [cf. 12, 13] that are associated with performing work and its related activities in general. However, information (retrieval) systems are a very good example of the techno-material objects where an interaction between technologies and intellectual norm structures are highlighted. The structures (e.g., classification schemas and meta-data) and openings (e.g., search options) created to regulate/get access to information within retrieval systems form a specified space for searching as a learning activity. Similarly, the content of information (retrieval) systems connects to a host of held traditions, values and facts by mediating certain information in a certain manner. As a consequence, they delimit the possibilities available for people using the systems for learning purposes.

The three conceptually separable dimensions shed light on searching as a learning activity from different angles and thus emphasize different facets of the phenomenon. However, in any actual, real-life occurrence of searching/learning, all three dimensions are at play.

2. EXAMPLES FROM EMPIRY

To illustrate the above reasoning, I discuss some of my previous findings. It appears that people in workplaces share a common understanding of what constitutes simple and complex work tasks. Similar tasks seem to prompt a retrieval of similar types of information and from similar types of information sources. Task performers seem to rather effortlessly recognize what information is necessary and from which sources to get it. This indicates strong professional as well as local work practices. This is a seemingly natural outcome since all the organizations that I have studied are “old” in the sense that they have long histories of their own. In addition, the main work is taking place within a sphere of well-established professions: local authorities, newspapers, and engineering companies.

However, the particular practices of a profession may lead to somewhat different results. For instance in work practices of engineers and municipal officers, the use of documentary sources (printed or increasingly digital) is considered suitable for retrieving task-specific and often factual information for simple tasks. For more complex tasks, information that is useful even outside a task at hand becomes relevant, both concerning the general domain area of the task as well as procedural information about how to handle the task. These wider requirements lead to inquiries made to peers and other people concerned. These findings differ to certain extent when studying journalists who turn to people as information sources to clearly larger extent than the other two professions studied. In their practice it is widely expected to emphasize “voices” of people involved in the topics. People involved are important for the other two professions as well, but in their practices these “voices” were incorporated to the work flow through a use of specified forms and other documentation. Searching – or perhaps more appropriately seeking – for information in relation to a work task thus was not only learning about a topic, but about the appropriate ways of performing work tasks. Although in my own work thus far, I have not been paying close attention to wordings and other expressions used in relation to searching a specific source, it seems to me plausible to expect that such wordings and expressions, as well as, evaluation of the information gained carry traces of the commonly shared work practice(s). One example is that engineers in general seem to value information that is presented in form of detailed drawings of existing or planned designs rather than purely text-based information. The above empirical findings illustrate the social dimension of searching as a learning activity.

The individual dimension has been more readily present in the main body of my research. Clearly aspects of prior knowledge of the topic and motivation play a role for information searching and seeking as well as for work task performance. The general traits that were discussed above and related to work practices take different forms by less experienced workers. Tasks that are routine tasks for an experienced worker appear to be perceived more demanding and complex by her novice peers; thus leading to similar information activities than in the more complex tasks in general. This is obviously a sign of learning how to do the work while attending to work tasks. Over time the novices turn to the

experts and become familiar with their work, including information searching. Another aspect of this dimension is motivation. However, based on my work, the motivational aspect does not appear to be as significant in a work environment as, for instance, it does in educational settings. This may be related to situational attributes, like time limitations. With tight time restrictions, there is less room for high ambition level.

Yet another interesting aspect is in regards to the perception of the work task genre. In addition to the simple-complex or usual-unusual work task, the tasks may also be considered on basis of their relation to professions. Work tasks may belong into the professional sphere, that is tasks where the worker's education is necessary, or they may be administrative tasks associated with a job (e.g., time allocation report and travel cost reimbursement), which are not based on the worker's educational background. Among other differences, one clear one is that the complexity of the work task, and the consequently more burdensome effort required in information seeking and searching, is dealt with differently [cf. 1]. It seems that in complex administrative tasks, information related activities are likely to be met with frustration almost as soon as an effort is required. However, the information activities related to complex work tasks related to the professional sphere are perceived as an opportunity for learning. Our tolerance for unclear and arduous information activities appears to be clearly higher in work tasks of our professional sphere than in administrative tasks or in any kind of tasks that we expect to be simple. This means that searching as a learning activity is mainly welcomed aspect of work only if it relates to complex tasks of a professional nature, whereas in relation to any other kind of task, it risks being an unwelcomed source of frustration.

The last dimension discussed in this paper is the technological dimension. Every trade has its tools and it seems that information (retrieval) systems are a commonplace part of nearly all workplaces; if not for the work tasks of the profession then for the administrative tasks. Although now commonplace, their history in the workplace is relatively short, only a few decades long. Given that the technological advancement has been vast during this period, the information landscape of the workplace has been in constant change for a longer period of time. This means that searching as a learning activity in itself is something to be learned and up-dated frequently. Searching to discover new information in order to gain new insights about a topic is thus only one aspect of the learning processes related to information systems in the workplace. Given that in many everyday work tasks we are actually striving towards a routine and effortless flow of information, the learning aspect of searching may actually be something as controversial as unwanted. As a consequence, it seems that it is the complex work tasks within the professional sphere that are most adaptable for viewing searching as learning in positive terms. In these tasks the worker will most likely view the system as an aid and not as a source of frustration and something to overcome. Therefore, searching as a learning activity in various workplaces requires different orientations and different support from information systems.

3. FUTURE RESEARCH TOPICS

I conclude my paper by suggesting some future research topics on searching as a learning activity and discussing their methodological consequences to study on interactive information retrieval:

1. Comparing searching as a learning activity within different work task genres

There are indications in my earlier findings that learning is more likely viewed in positive terms in work tasks that involve professional challenges than in work tasks of administrative nature. The complex professional tasks tend to evoke curiosity and a desire to understand the matter under consideration. This leads to more intense and thorough information seeking and searching, where information on different aspects and alternatives is sought for. There is greater tolerance for uncertainty and even contradictory information is accepted. Learning is an outspoken reason among others for looking for information in these tasks. On the other hand, learning is not mentioned while addressing administrative duties. Instead, feelings of frustration are more likely to surface if information acquisition does not proceed efficiently. These conclusions are based on small dataset and as mentioned indicative, but they are clear enough to be interesting for further scrutiny. What kind of work task genres may be identified in the workplace and how do they relate to information seeking and searching, as such and as a learning activity?

2. Relating searching as a learning activity to individual and social dimensions

Much research has been done on individual attributes and information seeking and searching. However, my research clearly shows that people in the same workplace tend to approach similar work tasks in a similar manner, including information related activities. Based on this we may assume that searching also has traits that are related to the individual attending a given work task as well as to the social context of the workplace itself. What kind of traits are there, how they relate to the individual and social dimensions, and how does the individual and social dimensions interplay in searching, as such and as a learning activity?

3. Identifying system/source properties and their relationship to searching as a learning activity

As learning happens in connection to searching, either by being a purpose of the activity or by being the learning object itself in the workplace, a number of information systems or other sources become involved. Different systems and sources (from Google to a colleague) have particular properties, like format in which information is available, possibilities to retrieve and extract pieces of information, interactivity, flexibility to modify content, vocabularies available, lucidity of content etc. My earlier findings reveal that people as information sources grow in importance in complex work tasks. The reason seems to be that people are highly flexible information sources that can provide many types of information and modify it to fit the work task at hand. These properties are valuable when the

task is not straight forward, and factual pieces of information are not enough, but the task requires both reflection and case-based arbitration, which – in some sense – is learning in the workplace. What are the properties enhancing learning, and how do they relate to searching as a learning activity?

4. Development of ethnographically oriented research methodology

In order to study the above topics and related research questions, it seems to me that different ethnographically inspired research methods will prove useful. Studying searching as a learning activity in real workplaces is best conducted by collecting data *in situ*. Both learning and searching are taking place as part of other activities and may pass with no reflection by the searcher/learner. This means that they may be difficult to cover in traditional qualitative research methods like interviews, let alone quantitative methods. Moreover, the complexities of real-life work environments make it difficult to simulate them in standard experimental designs. Therefore there is a need to expand towards methodologies where searching (as such and as a learning activity) is observed as it occurs in the contexts where it usually happens. Whereas all, if any research focusing on searching is naturally not necessary to conduct with fully ethnographic methods, different combinations and/or alternations may add value to the research designs and the results and conclusions arrived at. I believe that many research projects are likely to benefit if ethnographically inspired methods are developed further as part of the IIR method arsenal.

The above topics and connected methodological consequences enrich the theoretical and empirical scrutiny of searching as a learning activity. They further the ongoing efforts to relate specific acts or experiences of searching to goals and ideas beyond the single search episode. Searching as a learning activity becomes then intertwined into other human activities, like workplace learning in this paper. By embedding searching activity in this manner, there are greater possibilities to realistically study and explain searching as a learning activity as well as searching *per se* in real-life contexts.

4. ACKNOWLEDGMENTS

This work is inspired by and related to the initiatives of the European Network of Workplace Information (ENWI; <http://enwi-online.eu/>) funded by FORTE: Swedish Research Council for Health, Working Life and Welfare.

5. REFERENCES

[1] Borlund, P., Dreier, S. and Byström, K. 2012. "What does time spent on searching indicate?." In *Proceedings of the 4th Information Interaction in Context Symposium. Association*

for Computing Machinery, 2012. p. 184-193. DOI: <http://doi.acm.org/10.1145/2362724.2362756>

- [2] Byström, K. and Hansen, P. 2005. Conceptual Framework for Tasks in Information Studies. *Journal of the American Society for Information Science and Technology*, 56(10): 1050–1061. DOI: 10.1002/asi.20197
- [3] Byström, K. and Lloyd, A. 2012. Practice theory and work task performance: How are they related and how can they contribute to a study of information practices. In *Proc. Am. Soc. Info. Sci. Tech.*, 49: 1–5. DOI= 10.1002/meet.14504901252
- [4] Cohen, I.J. 1989. *Structuration Theory: Anthony Giddens and the Constitution of Social Life*. St Martin's Press, New York.
- [5] Dessne, K. and Byström, K. (in press). Imitating CoPs: Imposing Formality on Informality. *JASIST*.
- [6] Heinström, J. 2005. Fast surfing, broad scanning and deep diving: The influence of personality and study approach on students' information-seeking behavior. *Journal of documentation* 61.2, 228-247.
- [7] Isah, E. and Byström, K. (in press). Physicians' learning at work through everyday access to information. Manuscript accepted for publication with minor revision, *JASIST*.
- [8] Giddens, A. 1979. *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis*. Berkeley, CA: University of California Press. 50.
- [9] Limberg, L. 1999. Three conceptions of information seeking and use. In T. D. Wilson & D.K. Allen (Eds.) *Exploring the contexts of information behaviour. Proceedings of the ISIC*. (13/15 August 1999. Sheffield, UK). London: Taylor Graham, 116-135.
- [10] Savolainen, R. 2012. Expectancy-value beliefs and information needs as motivators for task-based information seeking. *Journal of Documentation* 68.4, 492-511.
- [11] Schatzki, T. 2001. Introduction: The practice turn. In T. Schatzki, K. Knorr Cetina, & E. Von Savigny (Eds.), *The practice turn in contemporary theory*. London: Routledge, 1-14.
- [12] Star, S. and Griesemer, J. 1989. Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science* 19.3, 387–420. DOI:10.1177/030631289019003001
- [13] Wenger, E. 1998. *Communities of practice: Learning, meaning and identity*. Cambridge: Cambridge University Press.
- [14] Wilson, T. D. 2008. Activity theory and information seeking. *Ann. Rev. Info. Sci. Tech.*, 42, 119–161. doi: 10.1002/aris.2008.1440420111