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Using contemporary practice-based approaches to generate data for guiding the design of information literacy learning environments - a preliminary study of engineering students

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Abstract

Introduction. This preliminary study examines the application of contemporary practice-based approaches to generate data for guiding the design of information literacy learning environments.

Method. This study was conducted by interviewing three engineering students who were participating at the Tools for master's thesis course arranged by Aalto University Library's Otaniemi Campus Library. The interview's structure was two-fold, as it first sketched out the participant's master's thesis practices through Schatzki's site ontology and secondly examined the perceived value of different information literacy learning tasks on the latter.

Results. The master's thesis practices of the interviewees were networked in complex ways with e.g. economic life and the interviewees invested much in them. Two of the interviewees worked with their thesis full-time with surroundings and tools provided by their employer. The interviewees valued most the lecture, which comprised of narratives of completed master's thesis projects and the lecture of scientific writing. From the asynchronous online learning tasks, the interviewees valued most the information retrieval task and the concept map exercise.

Conclusion. Spatial library spaces could be provided with asynchronous content such as descriptions of the library services through the tasks of the central user groups and e.g. introductory videos to information retrieval techniques. These contents could be spatially located so that they would serve as facile entrance points to the mobile digital library. The practice-based approaches seem to provide a fertile way of examining student learning and insights gained through them may prove to be valuable in designing new information literacy learning environments.

Keywords: blended learning, learning environments, information literacy, learning hubs, libraries as collaborative hubs, e-learning, practice theory, practice-based approaches

Introduction

The quick digitization of resources leads the library field to the following question: how the library spaces and learning environments could be designed so that they still enhance and create value to the mobile virtual library? And furthermore, since spatial space cannot be decontextualized, how well the current definitions of information literacy, which lean towards more generic abilities, can be set to guide the design of new learning environments? Even though local contexts and social structures transpiring through them form the basis of modern theories of learning, they are seldom taken into account in the individual driven notions of information literacy (for such critique, see e.g. Lipponen, 2010 or Lloyd, 2010a).

According to the prevailing notions of pedagogy, learning transcends the borders of formal learning spaces into ecologies of learning, which are composed of e.g. work and schools spaces, distributed online resources, different communities and peers (Barron 2006). The

digital resources have freed the learners to seek spatial surroundings, which they experience in a positive way. At the same time, digitalization has made learning more complex and fragmentary by e.g. creating the challenge of using different environments in the appropriate ways. (Staffans, Hyvärinen, Kangas & Turkko, 2010; see also Solvberg & Rismark, 2012) Respectively, the same challenges and possibilities are present in designing engaging learning environments.

This preliminary study examines the application of contemporary practice-based approaches to generate data for guiding the design of information literacy learning environments. This study continues the emerging trend in library and information science (e.g. Tuominen, Savolainen & Talja, 2005 and Lloyd, 2010a) as it attempts to view information literacy related phenomena through practice ontology. The framework of this study is based on works of Schatzki (2001, 2005, 2006). Due to the close connection of practice theories and modern notions of learning (see e.g. Lonka, 2012), the potential of their contemporary representative in designing engaging information literacy learning environments should be further investigated.

By focusing on the master's thesis practices of the engineering student, this study aims to provide new insights on their both classroom and online mediated learning. Firstly, this study sketches out the student's master's thesis projects according to Schatzki's site ontology. Secondly, perceived value of differentiated information literacy learning tasks on the latter is examined, and thirdly, the findings are discussed from the view of generating engaging learning environments for the engineering students.

Contemporary practice-based approaches and library and information sciences

Practice-based approaches or practice theories may be described as theories that strive to create a research lens in which the explanatory power does not solely reside in characteristics of the larger social structure, e.g. an institution or a technological infrastructure, or solely in the characteristics of an individual inhabiting that structure. It is by participating in practices, that individuals internalise e.g. norms, rules and shared understandings of larger structures. (Huizing & Cavanagh, 2011)

Schatzki's (2005) site ontology or site of the social, i.e., all social phenomena, is a constitution of both nexuses of practices and different material arrangements. Practices in these sites are composed out of actions and organizing structures. Actions are spatial and temporal performances, which as organized manifolds form the practices (Schatzki, 2005). The organizing structures are understandings on how to do things, rules that prescribe, require or instruct, teleoaffective structures and general understandings (Schatzki, 2006). Teleoaffective structures refer to the acceptable or prescribed ends, uses and emotions of the practice. Material arrangements are the material surroundings of the practice. A person participating in a practice necessarily does so in a setting with a material arrangement, which in turn affects and sustains the ways the practice is carried out. (Schatzki, 2005, 2006)

As the concept of teleoaffective structure suggest, the sites are experienced and understood in two real times: one being the objective time, or "familiar" time, and another being the activity time. By activity time Schatzki (2006) refers to a more complex notion of time in which the past and the future, or the movement from which motivates into acting towards an end, transpires also in the present of actions. The mere occurrence of joined actions in objective time does not exhaustively describe or make understandable the practices, which also contain potential teleological pasts and futures for the persons participating in them (Schatzki 2006).

There are several accounts (e.g. Savolainen, 2008; Lloyd, 2010a; Huizing & Cavanagh, 2011) to be found on how contemporary practice-based approaches could be applied in library and information sciences (abbr. LIS). In utilizing Schatzki's site ontology, this preliminary study is perhaps most related to Lloyd's (e.g. 2010a, 2010b) work. This study also complies with Lloyd's (2010a) goals of viewing information literacy as a practice that occurs inside of other practices, and not stressing on information skills but on "sociocultural affordances furnished within a site that lead to the development of information skills." To comply with the practice-

based approaches, it is of importance to ask from the participating social actors, that what constitutes as information within their practices (Cox, 2012).

Methodology

The data of this study were collected by interviewing three students participating in the 2012 autumn's Tools for master's thesis courses. Tools for master's thesis course is arranged by Aalto University Library's Otaniemi Campus Library and the participants come from all four technical schools (i.e. School of Chemical Technology, School of Electrical Engineering, School of Engineering and School of Science) of Aalto University. Participating in the Tools for master's thesis course is voluntary for the students and they receive 3 ECTS-credits for successfully completing the course. For more detailed account of the course, see Rousi, Palmgren and Heino (2012).

Before conducting the main interviews, two preliminary interviews were done after which the final structure of the interview was formed. A small fee was paid to the students as a reward for participating in either the preliminary or actual interviews. If a student participating in the course failed to turn in the required assignments, participating in the interviews was also offered as an option to compensate for missing assignments. All three students participating in the main interviews were working on their master's thesis at the time and all three represented different technical schools of Aalto University. The three main interviews were recorded and transcribed. The transcribed data was scrutinized through content analysis (see e.g. Patton, 2006) in order to seek predominating concepts and phrases.

The structure of the interview was two-fold. First, the students were asked questions about their master's thesis practices, which were conceptualized through Schatzki's site ontology. This section contained questions such as examining e.g.

- the most significant institutions and organizations, and their connections, related to their thesis
- the most significant tools and surroundings of their work
- what the students believed about the concrete skills and know-how which their thesis project created
- the areas of knowledge which it created
- why the students thought that completing the thesis work was important
- what was their motivation for participating in the Tools for master's thesis course.

The second section of the interview examined different learning tasks of the Tools for master's thesis course and their perceived value for their master's thesis practices. For more detailed descriptions of the tasks, see Rousi, Palmgren and Heino (2012). The structure of this section of the interview followed the differentiated tasks of the Tools for master's thesis course, examining

- lectures held in classroom environment
- group-working in classroom environment
- asynchronous online learning task of information retrieval
- asynchronous online concept map learning task (with online peer-review)
- asynchronous online discussions.

In this section, the interviewees were first asked to rate the value derived from the learning task on the scale of one to five (one being poor, two being adequate, three being good, four being very good and five being excellent). Secondly, the interviewees were asked to briefly explain their answers.

Results

Master's thesis practices

The master's thesis practices of the two of interviewees were closely linked with economic life, and thus constituted of highly complex dynamics of multiple parties. The third interviewee had

a slightly different type of dynamics in her practices, as they consisted mainly of interaction between her and her thesis advisor. The graduation and official master's thesis process appeared not as a leading thought in the responses of the interviewees, but more as an equal facet among many.

Two of the interviewees worked with their thesis full-time with surroundings and tools, such as computers and special software, provided by their employer. The third interviewee worked mainly at home and in Aalto University's computer classrooms. This interviewee wished, that proper working spaces would exist in the vicinity of her home. None of the interviewees described mobile devices such as tablets or smart phones as essential tools for their projects.

When asked about the concrete skills which were seen to be produced as a result of their projects, the most frequent answers were project management skills and information retrieval skills, which were both stated by two interviewees. When asked about the areas of knowledge, which the interviewees saw they gained from their projects, all the interviewees associated the question with their own professional development and with the usability of this knowledge in their future tasks as professional specialists.

All of the interviewees invested highly on their projects, which were deeply meaningful to them. One of the interviewees linked the completing of the master's thesis to forming one's identity and another to self-esteem. Two of the interviewees saw it as a transitional phase in their lives. What follows is an example answer from one of the interviewees.

Interviewee: "Well, it (finishing the master's thesis) is important in so many ways ... Sure, there are the titles and such, but they aren't so ... In some ways they are quite given, but now, now there's something in this ... It's a big deal mentally and you learn a lot about yourself. It's a really complex thing and it has to do with your self-esteem and other things, but then we're able to get ... This is like a new method, which we will be able to apply and start using, and we can sell it as a team afterwards, and it's this kind of concrete things that motivate me. That there is future involved in it and it has meaning. That's very important to me."

The interviewees presented various reasons of why they originally wanted to participate in the Tools for master's thesis course. One of the interviewees mentioned that at the beginning of the course, he was primarily interested in rehearsing the conventions of scientific writing. Other reasons stated were gaining overall knowledge about the master's thesis process and recommendations made by student peers.

Evaluation of the learning tasks

The task, which received highest grade point average, was the online exercise of information retrieval, which received a grade point average of 4.333 (from one being poor and five being excellent). Two of the interviewees stated, that it functioned well as it generated knowledge about the tools of information retrieval and their usage. One interviewee stated, that the subtasks of which it consisted had relevance to his work and that it incorporated a lot of useful information. What follows is an example answer from one of the interviewees.

Interviewee: "Yes, it was really useful ... I feel that, when I was doing my bachelor's thesis, there wasn't a systematic way through which one would have really shown how to ... There wasn't like a single place, where one could find out, that these are the kind of resources that are available, and this is how you use them. Perhaps we should have had something like this available earlier in our studies. Like a clear list of instructions on how to conduct information retrieval."

Both the lectures held in classroom environment and the online concept map exercise received grade point average of 4.0, which was the second highest average received by the learning tasks. When the interviewees were asked to explain briefly, that what lecture content they found most useful, all of the interviewees mentioned both the lecture comprised of experiences about previously completed master's thesis projects and the lecture of scientific writing. The experiences of the recently graduated were seen as helpful as they showcased

different ways producing acceptable results. Even though some of the narratives included a prolonged master's thesis project, the narrators still saw their processes as successful ones. The lecture of scientific writing was valued for its concrete tips on how to write a master's thesis, including e.g. the overall structure of the thesis and the scientific style of writing. What follows is an example answer from one of the interviewees to the question of why he felt, that the narratives about previously completed master's thesis projects were important.

Interviewee: "Maybe it (hearing the narratives) helps you in the sense, that it eases the hype and pressure. [...] You may feel pressure about your timetable and you still want the result to be of high quality, and if you seem to be running out of time, it feels like ... If even one of these aspects forces you to prolong your work, then it is going ruin the whole thing. But when you listened to those (narratives), you got the impression, that everyone of them did quite well, and they were still pretty pleased with the process as whole. They just simply accepted the fact, that it took them longer than they expected, but that it still ended up well."

The interviewees saw the concept map exercise as valuable in two ways. Two of the interviewees stated that it helped them to create an outline of their work, which they saw as vague during the start of the course. One of the interviewees also stated, that seeing the concept maps of other participants gave him insights on how also he could approach his master's thesis. What follows is an example answer from one of the interviewees.

Interviewee: "Yeah, the concept map ... Well, I started this course right about the same time as I started my master's thesis and my thesis subject at the time seemed to be made of loose unconnected matters. And then (in the concept map exercise) one really arranged them for oneself. That helped to sketch out the focus of one's thesis subject."

The group working in the classroom received a grade point average of 3.333. Two of the interviewees stated, that they valued the free interaction amongst the course participants, which the group working assignments created. One of the interviewees wished, that more time could be spent to the group working.

The asynchronous online discussions received a grade point average of 2.666. All of the interviewees thought, that it was valuable, that one could read the answers of other participants of the course. One of the interviewees stated, that she was disappointed in the amount of the actual interaction that was produced through these online discussions. Two of the interviewees stated, that they thought that the required length of the posts (single A4) were too long. Table 1 summarizes the grade point averages received by the learning tasks of the Tools for master's thesis course.

Learning task	Received grade point average
Online information retrieval task	4.333
Lectures held in classroom environment	4
Online concept map exercise (with online peer-review)	4
Group working in classroom environment	3.333
Asynchronous online discussions	2.666

Table 1 Summary of grade point averages received by learning tasks of the Tools for master's thesis course (one being poor, two being adequate, three being good, four being very good and five being excellent).

Discussion

As the results of this preliminary study seem to confirm, the practices in which the library's user groups participate, can be deeply meaningful to the users. Since the library user might be much invested in their practices, e.g., in their master thesis projects, they seem to value very different kinds of information related to them. In order to generate engaging learning environments, specialized library services could be presented through task specific portals or websites, which utilize the commitment of the users to their task at hand.

Utilizing Schatzki's site ontology in gathering data for guiding the design of information literacy learning environments seems to create more user-centred focus of research. Utilizing this approach also seems to create insights into the complex networked tasks of the users and into the embedded motivational structures of these tasks. The notion of relational and networked knowledge seems lend itself well for examining the dynamics of higher level learning tasks, such as a master thesis project. An interesting result of this preliminary study is the emphasized importance, which the engineering students gave to hearing the narratives of previously completed master's thesis projects.

Besides learning about the teleoaffective structures of previously completed master's thesis, the interviewees valued the following content provided by the Tools for master's thesis course. The asynchronous online information-seeking task received the highest grade point average, as it was seen to generate knowledge about the tools of information retrieval. The asynchronous online concept map exercise was seen as a good tool of outlining one's master's thesis work and it was also seen as an efficient way of learning about the master's thesis projects of other course participants. Also the content of the lecture of scientific writing were valued by the students. If portals of specialized services are designed for the engineering students working on their master's thesis, the latter content would seem suitable for it.

To answer the original question on how the spatial library spaces could be set to still enhance the digital mobile library, it seems important to answer first the question of what is it that spatial space does? It seems to be able to both bring forth and conceal. As such, it is able to recommend and perpetuate the use of different technologies and also specific combinations of technology and content. As spatial space is thoroughly social, it is always infested by the meanings of its users (Staffans et al. 2010). Spatial space can also be seen as a suitable media for the sharing of spoken and corporeal information of e.g. permissible emotions and affects of a certain practice, i.e. what Lloyd (2010b) refers to as 'social and corporeal modalities' of information.

Conclusion

Library services could be presented through the central, possibly deeply meaningful, tasks of its central user groups. These portals to specialized services could be spatially located so that they offer facile and meaningful entrances to the vast mobile digital library. For engineering students working on their master's thesis the following content could be provided through these possible portals: instructions on information retrieval, tools for outlining the focus of their complex tasks (e.g. concept map tools) and content about scientific writing. Spatial space seems also have the advantage of mediating well e.g. information about the acceptable or prescribed ends, uses and emotions of the practices, which the interviewed students seemed value in their master's thesis projects.

Schatzki's site ontology seems to provide a fertile way of examining student learning. It seems to shift the focus of examination towards more user-centred and creates insights into complex and networked tasks of the students. Approaching student learning through Schatzki's ontology also seems to bring forth the embedded motivational structures of the students' tasks. Insights gained through this approach may prove to be valuable in designing new information literacy learning environments, or, in other words, the engaging compositions of spatiality, technique and content.

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