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Citation for the original published paper (version of record):

Haglund, L. (2020)
Evidence basing the study environment needs at a small specialist university by using design thinking methods
Journal of EAHIL, 16(1): 4-11
https://doi.org/10.32384/jeahil16327

Access to the published version may require subscription.

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Evidence basing the study environment needs at a small specialist university by using design thinking methods

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Abstract
The article describes a case study, using design thinking methods, to evidence base the renovation of two buildings on the university campus of the Swedish School of Sport and Health Sciences (GIH) Stockholm, Sweden. The project involves several stake holders and is looking at the general study environment, and not only the library space. In the discussion the author compares the processes from evidence-based library and information practice, design thinking methods and a hybrid model, as well as outlines some learning points from the project.

Key words: *libraries; universities; students; evidence-based practice; case reports.*

Background

The Swedish School of Sport and Health Sciences

The Swedish School of Sport and Health Sciences (GIH), was founded in 1813 by Pehr Henrik Ling, which makes it the oldest university in the world within its field. GIH offers degree programmes preparing for the teaching profession in Physical Education as well as for career in Sports Coaching, Sport Management or Preventive Health. The degree programmes have a duration of three to five years (1). The research focus at GIH is on sports pedagogics and human biology. Research is characterized by its close contacts with students and by multidisciplinary projects (2).

In the long history of GIH the number of students has had a slow increase over many years. This changed dramatically in 2011 when a large number of students from Stockholm University were transferred to GIH. The number of full time (FTE) students increased with more than 50 %, from around 400 to 645 in 2011 (3). In 2017 the number of FTE students were 725 (4).

The current campus buildings

The current main building on campus was erected in 1945-46, situated next to the 1912 Olympic stadium. For many years the need for more space, including renovation of the present buildings were up for discussion, and finally, in 2009 the decision was made to start planning for a new building and renovation of the old, with an aim to improve the study environment (5, 6). During the planning stage the coming huge increase in student numbers wasn't known, which meant that the new building that was finished in summer 2012 was not sufficient for the much larger student body (3).

In the renovation that was undertaken in 2011-2012, one of the buildings on campus was not included (called Tegelhögen). This building used to accommodate both office space and research facilities. In 2017 the decision was made to renovate Tegelhögen, with two purposes; additional office space for staff, and student space. In preparation for this building process the following project was initiated.

Project objectives

The overall aim of the project was to provide the involved architect and interior decorator with evidenc-based information about the needs of the students. We wanted to

- establish a clear picture/map of student needs, both in Tegelhögen after renovation, and in the main building once the intended functions have moved to Tegelhögen;
- understand the needs and challenges of other users

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(e.g. academic teachers and other staff), in relation to the students;
- create a needs map to enable us to produce a clear brief to the architect and interior decorator.

To be able to get the information needed in the project we wanted to investigate the needs of the students by trying to understand them as well as possible. To avoid drawing on general opinions and ideas of the staff involved in planning the renovation, we decided to use a design thinking method, in the hope of getting a more unbiased and innovative basis for discussion.

Design thinking

There are many descriptions of what design thinking involves, one of them being *Change by design* (7), by Tim Brown, CEO of the innovation and design firm IDEO[1], which is often associated with design thinking methodology, and has also developed the web site *Design thinking for libraries*, with a toolkit which has been translated into 15 languages (8). The book describes the fundamentals of design thinking, stating that design thinking is an exploratory process, and that there is no one best way to move through the iterative process, which can be described as a system of overlapping, and looping, spaces or steps; "*inspiration*, the problem or opportunity that motivates the search for solutions; *ideation*, the process of generating, developing and testing ideas; and *implementation*, the path that leads from the project room to the market" (p. 16).

One problem when trying to improve design (or service design) is that people often are so good at adapting to inconvenient situations or things that they are not aware that they are doing so. If you approach a design project from a design thinking view, you want to learn about people and their behaviour, to help them articulate the latent needs they may not even know they have, by applying the key elements *insight, observation and empathy*. Insight is what you gain by applying observation and empathy to the task you are working on (p. 39-41). Observation is to watch what people don't do, and listen to what they don't say, basically applying anthropological or ethnological research methods instead of the more common qualitative methods (focus groups, questionnaires etc.) (p. 43). The empathy element is all about making an effort to see the world through the eyes of others, to "borrow" their lives to inspire new ideas, and to recognize that their inexplicable behaviour represents different strategies for coping with the world they inhabit (p. 49-50).

The cover of *Change by design* states that design thinking can be used to address a wide range of issues and concerns, and is often most powerful when applied to abstract multifaceted problems, like improving the guest experience in a hotel, or developing the space and activities when planning a new public library, e.g. Dokk1 (9). Comparing the steps in evidence-based practice (10, p. 6-7) to the description of the design thinking process there are many similarities, but also important differences; the design thinking process has a stronger emphasis on iterations and being non-linear as well as on testing, experimenting and flexibility. According to a presentation at the 6th Evidence Based Library and Information Practice (EBLIP) conference in Salford, UK in 2011, merging the steps of the evidence-based practice process with elements from design thinking into a hybrid model could be a successful way of solving wicked problems in libraries (11).

Method

Two consultants from a local design thinking team, OpenLab (12), was contacted to help lead the project team apply suitable design thinking methods. The in-house project team was put together to get input from different work areas at the university. The core team was comprised of three librarians, one receptionist, the student union clerk, and one caretaker, but two additional staff members and one student representative was also involved.

Timing

After some discussing, it was decided that we should go through with the project before end of spring semester 2018, even though this gave us less time for both planning and implementation. Waiting until the autumn semester would mean losing the experienced students that were going to graduate soon, and instead get freshmen that were very happy with everything since everything was new to them.

[1] https://www.ideo.com/eu

Project activities

Project activities included two workshops, a meeting and the user study, starting on 2 May and finishing on 4 June (*Table 1*).

Workshop 1	***2 May (4 hours)***
• Using the experiences of the project team members to collect "top of mind" needs and insights regarding student needs. • Looking at the premises involved in the planned renovation, to find out the present challenges and limitation. • Sharing experiences and insights of the needs of our primary users (the students), but also the secondary users (academic staff, caretakers, cleaners etc). • Discussing possible future needs and challenges to create a map of needs and insights, identifying knowledge gaps, and prioritizing what needs to be researched by the project team.	
Meeting	***9 May (2 hours)***
• Instructions and guidance in preparation for research/interviews.	
User study	***10 May – 1 June***
• Research and documentation done by project team members; interviews, observations etc. according to instructions by OpenLab.	
Workshop 2	***4 June***
• Working through the collected information from the user studies, looking at behaviours, attitudes, needs and challenges. Prioritizing. • Capturing early ideas for solutions. • Output will be a consensus and a common target for the final report, to give a clear brief to the architects.	
Deadline for final report from OpenLab – 21 June	

Table 1. *Project timeline and activities.*

Workshop 1

The core content of workshop 1 was to compile an empathy map, describing the project team member's perceptions regarding the GIH student. We were asked to note our thoughts on sticky notes individually, in writing and/or drawing, and then presenting them to the rest of the group by putting our notes on the empathy map. The five parts of the empathy map:

- What do they think and feel about being a student at GIH and studying/spending time on campus?
  - What do they dream about? What are their goals? What motivates them? What frustrates? What worries them? What's most important? What are their feelings about the study environment?
- What do they see at GIH?
  - How do they perceive the premises on campus? How would they describe the study environment? What do they see others do?
- What do they hear?
  - What can we imagine they hear? What does the sound environment look like? What do they hear others say? What is there talk about?
- What do they say?
  - What can we imagine they say about being a student at GIH, and about spending time here? What are their attitudes regarding the study environment?
- What do they do?
  - What do they do, and how do they behave? Can we detect any particular behaviours? How do they work individually? In a group? What kind of activities take place on the premises?

The second part of the workshop included a group discussion to map student activities today, including the limitations and challenges, and what works well. All comments were written on sticky notes and posted on maps of the study spaces (*Figure 1*), and we then summarizing by individually listing the most important needs for the upcoming renovation, including knowledge gaps that needed to be explored.

All input from the first workshop was compiled by the project coordinators from OpenLab and used as a basis for planning the next phase.

User study

The main research was undertaken by interviewing students from all our study programs and talking to students from as many different semesters as possible. An interview guide was provided by Open Lab, including the following instructions;

- interview (what the user says they do)
- immersion (what the user experiences)

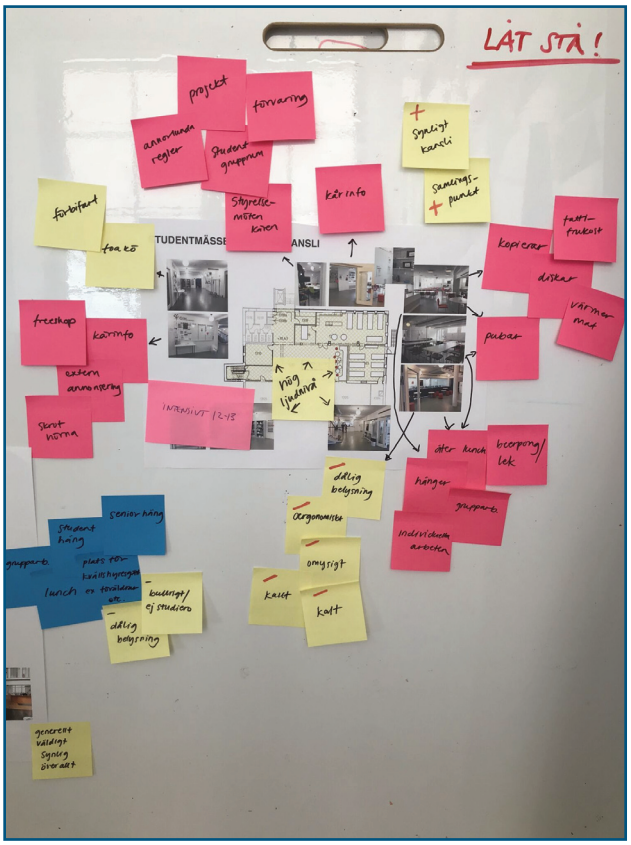

Fig. 1. *Example from workshop 1. Plan and photos from student canteen floor, with sticky notes commenting on limitations and challenges, and what works well. Some of the comments: noisy; always very visible; cold; not very cosy; intensive period 12noon-1pm; eating lunch; relaxing; copying; doing dishes; bad lightning.*

- observation (what the user does)
  - use open questions
  - ask about specific experiences
  - listen for needs and feelings
  - when you don't get an answer, ask why, why, why (are there driving forces behind)
  - don't be afraid of silence
  - Try to take photos of the things mentioned by the interviewee, and document insights, stories and observations.

We were also given a list of questions to use as starting point for the interviews.

The interviews were done by spontaneously approaching students on campus, and were conducted by pairs of project members. A total number of 21 students, of which 11 men and 10 women were interviewed, from all programmes (*Table 2*). In addition to this, 3 academic staff were asked the same questions, answering regarding their observations of and feedback from students, but also in regard of their own needs.

A number of observations, some accompanied by photos, were also documented and included in the study.

Study programme	*2nd semester*	*4th semester*	*6th semester*	*8th semester*	*10th semester*
PE teacher	*2*	*8*	*1*	*-*	*1*
Sport managem.	*-*	*1*	*-*	*NA*	*NA*
Preventive health	*1*	*-*	*3*	*NA*	*NA*
Sports coaching	*-*	*-*	*2*	*NA*	*NA*
Master	*-*	*2*	*NA*	*NA*	*NA*

Table 2. *Number of students interviewed.*

Workshop 2

Meeting up for the second workshop we reported back on our experiences from the interviews, focusing on the most interesting things, if we had found out something new, and what was confirmed of our thoughts from workshop one. We were asked to reflect on if we had identified any feelings or attitudes in connection to specific spaces; if we had found specific behaviours in specific contexts; if there were any contradictions in the answers to our questions; and if we had detected any needs that they didn't express. After an initial overview of what was found out during the interviews, we discussed each question more in depth.

Using a needs map prepared by Open Lab after workshop one, we then moved on to the idea generation step. We were asked to individually reflect on three questions, then discuss, iterate three times, and then present to the whole group. The questions were

1. Group study. How can we create more and better spaces and bases for group study work, without creating more messy or loud environments?
2. Social interaction. How can we create cosy and attractive spaces for social interaction with a good sound environment, and without noise spilling over into other spaces?

3. Individual work. How can we create better/more quiet spaces for individual work, which will be respected for the intended use?

What is most important to solve? What can we do now, and what do we want to do in the near future?
During all discussions sticky notes were used to document, and Open Lab staff were also taking notes.

Results

Comparing the summary from workshop one with the final report from the project coordinators, some new insights were revealed to the project team, but the overall result is that we are quite aware of the needs and priorities of our users. A comparison of the needs map created after workshop one and the needs map in the final report gives you more or less the same picture of the different student needs (*Figures 2, 3*).

The final report reveals a student that is perhaps different from students in common, in that their studies daily integrates physical and theoretical studies/activities, giving rise to special needs when it comes to study space. They are also focusing on their physical appearance and on their bodies, as well as exercising and practicing movement in all kinds of places, including the library. They are also quite loud, which, together with the bad acoustics in some parts

Fig. 2. *First needs map. Darker blue: individual silent study rooms; more space; storage needs; flexible furniture and space; zones for different activities; space for physical movement; more group study space. Light blue: silent areas, in general lower volume; improved lightning. Green: relaxing areas; phone rooms/single rooms/rooms for resting; silence and solitude. Red: social space; more cosy space; more accessible information and teachers. Purple: more meeting rooms and offices.*

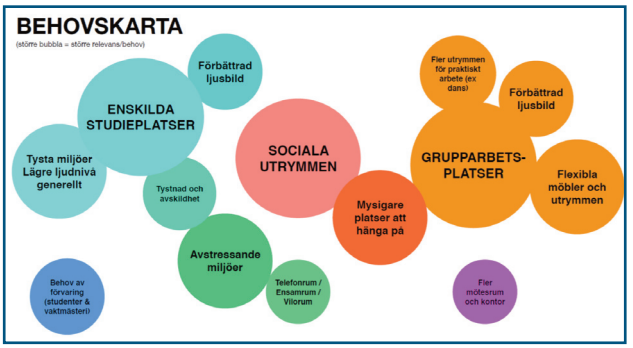

Fig. 3. *Revised needs map, from final report. Dark blue: Need for storage (students and caretakers). Light blue: individual study space; silent space, lower volume in general; improved lightning. Green: relaxing space; silence and solitude; phone rooms//single rooms/rooms for resting. Orange: Social spaces; cosy spaces. Yellow: Groups study space; flexible furniture and space; improved lightning; more space for physical movement. Purple: more meeting rooms and offices.*

of the buildings, causes difficulties to focus and to find quiet spaces for individual study or relaxation. Social interaction is an important part of their day, and they experience a lack of cosy and comfortable spaces for chatting with other students.
The most important areas for improvement (the biggest bubbles on the needs maps) were, as anticipated; spaces for group study work; spaces for individual studies; and spaces for social interaction.

Group study work

It came as no surprise that the need for group study work was highly prioritized in our study, both by students and by the project team. There are not enough group study rooms on campus, which results in group study taking place everywhere possible, creating a loud and noisy environment for both students and staff, and causing problems when students are trying to find a quiet space to focus on their work. What was new to the project team was the need for flexible furniture, since group work can be both theoretical and practical /physical, sometimes a combination of both. More surprising was the expressed wish for a cosy atmosphere instead of the preferred Scandinavian public spaces which are often designed with a "less is more" mind set. Students suggested potted plants, art/paintings, windows with a view, and stressed how important this is for their comfort and for them to thrive.

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Individual studies

The project team had also identified the need for quiet spaces suitable for individual concentrated study, and the user study *confirmed* that this is an important need. The lack of group study areas and the following noise pollution has consequences for the designated silent areas. New insight for the project team was that to some students the glass walls of the library (and some other spaces) were a problem due to the constant movement outside, and that you couldn't be "unseen". There were also suggestions for different levels of silent spaces.

Social interaction

Social interaction is an important part of daily life at GIH for our students, and the project team was well aware of the need for increased space and for more welcoming furnishings, instead of the present more bare and austere student canteen and adjacent areas, as well as the bad acoustics. The user study didn't give us any real new insights, but confirmed the need for different kinds of spaces for different kinds of social interactions.

The culture of GIH, as derived from the study

In the final report the Open Lab project, coordinators identified the following important parts of GIH culture:

- community and group spirit;
- practical and theoretical;
- relaxed atmosphere;
- history and tradition;
- joy in movement;
- acknowledged research.

Recommendations from the project coordinators

The project coordinators listed a number of recommendation drawn from the above, the most important ones being; the need to create distinct zones or "neighbourhoods" on the premises, with suitable furnishings to make it easy to understand what is expected to take place there; to prioritize sound levels; maintain the possibilities for social interaction, which is an important part of the GIH identity, by creating suitable and inviting spaces for different social activities; and don't forget that students often needs to combine the theoretical with practical/physical activities and that space for that needs to be flexible.

From project to reality

The status at the time of writing (June 2019) is that all plans for the renovation of Tegelhögen are more or less in place, and that work will begin in autumn 2019, with the planned opening of the renovated space in mid spring 2020. Then the emptied areas in the main building will be rebuilt and renovated.

The final report from the project was delivered to the project leader for the renovation, and the working group directly involved in the renovation work has been recurrently reminded of the recommendations in the report. One of the librarians involved in our project has been invited to some meetings of the working group, but due to unforeseen staff changes the planning phase for the renovation has been delayed, and then accelerated again, resulting in a gap in involvement from our side. A short meeting with a new coordinator for the renovation was scheduled, where one of the project members was asked to highlight the most important findings, but no contact with interior decorators etc. has occurred.

When the time comes to start working on rebuilding and refurbishing the areas in the main building, we will use the findings from our study, trying to accommodate the expressed needs of the students, and taking into account that there might be a need to do some follow up interviews with present students.

Discussion and learning points

When the concept of evidence-based library and information practice (EBLIP) was starting to gain interest in the Swedish library community there was also some criticism (13-16). The criticism from Sweden discussed the fact that applying the EBLIP processes (10) to problems and questions and at the same time doing your day job was almost impossible, because it was too time consuming and rigorous, and not the individual activity described but a collaborative process. Discussions among Swedish colleagues also focused on the "research based" part of EBLIP, and more or less ignoring the "librarian observed and user reported" possibilities, and adding the difficulty to find published evidence from the Swedish context. At the 6th EBLIP conference in 2011 the paper by Davis and Howard took some of the criticisms into account, by suggesting a hybrid model combining the EBLIP process with design thinking (11). For a few years EBLIP captured the interest of Swedish librarians,

perhaps mainly in medical libraries because of their experience with supporting evidence-based medicine/health care, but in recent years the interest and knowledge has been low to non-existent. Instead there has been an increasing interest from the library community in user experience (UX) work and applying methods from ethnology and anthropology, with design thinking as one example. UX has emerged as a way of finding out what our users really need and want, not using the usual questionnaires and getting the same answers: that they are very happy and content with library services.

Looking back on the suggested hybrid model, and comparing with the EBLIP process (*Table 3*) it is the conclusion of the author that, depending on your problem and objectives, and resources available, you could claim to have used either model, if you acknowledge that user reported and librarian observed evidence are equally important to research based. According to all three models we're still on the fourth step, implementation/application of results of appraisal, or even waiting to see what can be implemented.

Could we have gotten the same answers by using an ordinary questionnaire or focus groups, asking them to tell us what they thought of the different elements of their study environment? Since we didn't have a control group there is no way to know, but the fact that the user study didn't reveal any really surprising new insights it is the impression of the project team that there would have been little difference. What is more interesting is that when you don't ask outright how happy they are with what they have, the outcome stands out as more reliable evidence, when a majority, including project team members and academic staff, expresses the same needs.

EBLIP process (10)	***Design thinking (11)***	***Hybrid model (11)***
Define problem	Find problem	Define problem
Find evidence	Research	Research
Appraise evidence	Prototype and test Proto-	type and test
Apply results of appraisal	Implement	Implement
Evaluate	Evaluate	Evaluate
Redefine problem	Storytelling	Storytelling

Table 3. *Comparison between the processes from EBLIP, Design thinking and a Hybrid model.*

The main learning point is that it would have been desirable to involve the architect, interior decorator and members of the renovation working group, to ensure a higher interest in and application of the results on the renovation plans. The project team members all agree that it was a useful experience and an effective way of getting reliable results in a short time, but that the outcome relied on having methodological expertise to guide, document, and help see the big picture. With more resources and different timing, it would also have been possible to have more iterations, by really prototyping and testing layout and furnishing of the different areas for improvement.

These learning points will be kept in mind when planning future user centred projects. The interview method of asking indirect questions will also be applied to an upcoming benchmarking activity with our colleagues at library of the Norwegian School of Sport Sciences[2].

Received on 30 August 2019.
Accepted on 20 January 2020.

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