Building Design Capabilities in Academic Libraries

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While design-led innovation may have huge potential to change both tangible outcomes of design, such as products and services, and the intangible ones such as values, mindsets and organizational cultures, the approach has not been broadly investigated in the organizational settings, especially when it comes to building in-house design capabilities. The paper reflects on both practical and theoretical concerns around building of design capabilities in academic libraries. The making and sustaining design capabilities was supported by design interventions in the form of design workshops and other design activities, and repeated re-enforcements of constructivist and experiential organizational learning leading to integration of design proto practices with daily routines and established work practices. The findings are articulated as a set of guidelines toward building design capabilities in academic libraries through design thinking. At the conceptual level, the work highlights the importance of openness, dialogical spaces and temporal aspects of such processes.

Keywords: Design capabilities, research through design, design thinking, knowledge brokers, design interventions

Introduction

In the past decade, we have witnessed extensive changes in the roles of libraries in general, and academic libraries in particular. Academic libraries have been challenged, on the one hand, by the emergence of new technologies and devices (e.g., e-book readers, smart phones), digitalization (e.g., Google Scholar) and new ways of research and knowledge management (e.g., Research Gate) (Saunders, L. 2015). On the other hand, academic library users are often competent and are early adopters of new technologies and digital tools. They also have ever increasing demands for good user experiences and services and solutions that support their dynamic work patterns, both in physical and digital environments (Sennyey, Ross, & Mills, 2009). This situation requires paying continuous attention to the role of the library in an academic community, including consideration of the services on offer. In other words, academic libraries must be ongoingly concerned with institutional visions and strategies for the future, and develop innovative practices that allow them to be active and agile forces within the academic communities they serve. One approach to tackle this challenge is based on adoption of designerly ways of thinking in an organization, and building design capabilities toward sustained innovation and strategic reflection efforts.

We make a distinction between designerly ways of thinking and working and design thinking as commonly appropriated in business management. The former has been tied to design research and understanding of how designers think, reflect and act, see for example, (Buchanan, 1992; Krippendorff, 2006; Margolin & Buchanan, 1996; Schön, 1983, 1992). The latter has been praised as one of the best approaches to innovation and organizational transformations, for both public and private sector. The literature here is extensive, but we
The paper is organized as follows: the next section presents a selection of literature focusing on design capabilities and tools for building them. We proceed by presenting sections on the methodology, the case, and the findings, which led to the set of guidelines.

Background

In this section, we first provide a brief reflection on previous work regarding building of design capabilities. Then frequently used tools that support design thinking, such as cards or mappings, are outlined.

Later examples in entrepreneurial and managerial discourse around design in institutional settings (Malmberg & Wetter Etterman, 2016; Malmberg, 2017) point in the direction of building institutional design capabilities.

Given their need to innovate, libraries have also turned toward design thinking. Consultancies like IDEO (IDEO, 2014) developed a set of methods for working specifically with library’s visions, strategies and responsiveness to external challenges. However, these tools were useful when professional designers guided the work. When their work was done, the design thinking and innovation efforts would often stop.

Thus, in this paper, we propose an approach that aims to provide for sustained (over time) abilities to work with design-led innovation by building *in-house design capabilities*, so that academic libraries can respond to both external and internal challenges more appropriately. This does not imply that professional designers and design consultancies cannot play a role in innovation any longer; it just scaffolds forces within the organization to understand design and be able to work with or without professional guidance more effectively.

The research presented in this paper is of an explorative and experimental nature, aiming to inquire into how to approach developing *in-house design capabilities* at an academic library. Research through Design (RtD), see (Bowers, 2012; Dalsgaard, 2010; Fallman, 2008; Gaver, 2012; Höök et al., 2015; Koskinen, Zimmerman, Binder, Redstrom, & Wensveen, 2011; P.J. Stappers & Giaccardi, 2012; Zimmerman & Forlizzi, 2014) was chosen, inspired particularly by the work of Fallman (2008), as it focuses on how design practice, design explorations and design studies combine to address the research positioning towards discovery of best practices, tools and methods that support emergence of design capabilities within an academic library. Other approaches, such as action research could have been a good alternative. However, experimental quality, flexibility and openness of RtD, as well as continued insistence on reflection, were characteristics that led to choosing the RtD for this work.

The library as an organization had no prior orientation towards design or design thinking. Methodologically, we use designerly ways of thinking and working to introduce design thinking processes and enable library employees to gain design capabilities that can, in turn, sustain the use of design-led organizational transformations and innovation of products and services. The research was carried out through design of a series of sixteen design interventions, in the form of design workshops or other design activities. The interpretation of the design practice, exploration and studies in the context is presented in detail in the methodology section of this paper. Constructivist and experiential organizational learning were used to gain design capabilities and establish designerly practices. This learning was re-enforced by repeated interventions (each having a different design goal), and over time, led to integration of these ways of thinking and working with daily routines, transforming the work practices in the library (Pandey, 2015). The contribution of this paper is a detailed presentation of how design capabilities were introduced and incorporated into everyday practices, with general guidelines as a starting point for knowledge transfer to other settings.

The paper is organized as follows: the next section presents a selection of literature focusing on design capabilities and tools for building them. We proceed by presenting sections on the methodology, the case, and the findings, which led to the set of guidelines.
Building design capabilities has been a recent topic of interest and described by, for example, Malmberg & Wetter Edman (2016) and Malmberg (2017). They put emphasis on how design capabilities are sustained within the organization, after project activities end. Malmberg (2017, p. 218) has observed that participants of design projects are often, after the project ends, not followed any further, and no attention is paid to strategies that enable them to spread design capabilities in the organization. This led to the conclusion that projects where skilled designers have learning-by-doing-based design workshops does not support “sustained innovation capability through design knowledge” (Wetter Edman & Malmberg, 2016). As pointed out in Malmberg & Wetter Etterman (2016), there is a gap to be addressed: “...and we see issues when it comes to structures that support diffusing and upholding new knowledge, for example, a lack of managerial activities that can support assimilation”.

Service designers, along the same lines, found that the design tools and methods they try to use in organizations do not produce “the kind-of high-level transformational thinking in managers” they hoped for (Junginger, 2015). These findings were also true for libraries as organizations, and some researchers, e.g., Bell (Bell, 2011) argues in favor of including design thinking as a subject in librarianship education, and a way to gain design competence. In (Booth, Schofield, & Tiffen, 2012; Tiffen & England, 2011), the authors propose inclusion of design activities within the library through cooperation with the School of Design, which facilitated the use of design thinking approach on a more continuous basis. In (Luca & Narayan, 2016), design activities within the library were supported by an artist-in-residence, and in-house designers. A design thinking project at an academic library, described in Whang et al. (2017), explores its concrete applications to specific services, such as support of transfer students. The service focus is the one that is the most frequently reported on regarding library services innovation, see (Scupola & Nicolajsen, 2010), or (Trischler & Kelly, 2016). The latter used co-design with users at three different academic libraries in Australia. However, in line with findings from Malmberg & Wetter Edman (2016), when co-design activities stopped, so did the projects.

One of the largest design consultancies, IDEO (2014), focused on tools and methods for innovation in libraries. The toolset has been developed through a large project concerned with design for a Danish public library. The project is described in Dindler et al. (2016). Others have built on this work, e.g., (Zbiejczuk Suchá et al., 2015) or (Modern Human, 2017), both providing card sets inspired by those of IDEO, specifically to facilitate design thinking for libraries. However, it is difficult to use toolsets without the basic design knowledge, and it is easy to underestimate the importance of designer’s tacit knowledge and sensibility for the positive outcomes of processes supported by the toolkits.

Diverse forms of mapping are also frequently used in conjunction with design thinking. We find Giga-mapping (Sevaldson, 2011) to be particularly useful. It aims to facilitate thinking and communication by visualization, inviting participation and collective negotiation of understandings related to the design context, usually by providing a large physical work space for these efforts. Furthermore, it allows for mapping out the context in layers (e.g., from the perspectives of different stakeholders), fostering further understanding of complexity and relatedness of problems.

From this background work, we find that in order to sustain design capabilities, diverse tools can be effectively employed, but also, attention needs to be paid to develop structures that support diffusing and upholding new designerly knowledge.

**Methodological approach**

**Research through Design (RtD)**

Research and design have been long regarded as separate endeavors, in particular within interaction design and human-computer interaction. Research through design (RtD) is a recent effort within those fields to merge the two, building on designerly ways of thinking and working (see Bowers, 2012; Dalsgaard, 2010; W. Gaver, 2012; Höök, Dalsgaard et al., 2015; Koskinen, Zimmerman, Binder, Redstrom & Wensveen, 2011; P.J. Stappers & Giaccardi, 2012; Zimmerman & Forlizzi, 2014), using design research, its theories and practices, as the main vehicle to generate new knowledge, often engaging users to validate, evolve and evaluate the work. As articulated in Höök et al. (2015, p. 2), one of the main issues that RtD faces is how to articulate the gained design knowledge, and allow design researchers to engage with, and build on, one another’s contributions. There are several proposals aiming to establish connections between theory, and practice, e.g. (Fallman, 2008; Gaver, 2012; Höök & Löwgren, 2012; Odom et al., 2016) and others. One of these approaches is Fallman’s interaction design research triangle (Fallman, 2008), a tool to guide and describe research and design efforts.
The triangle frames the work by three main activities: design practice, design studies and design exploration. Each one of these “has its own purpose and intended outcome and the rigor and relevance have to be defined and measured in relation to what the intention and outcome of the activity is” (Fallman & Stolterman, 2010). Recognizing that research practices do not normally fall neatly into one of the three activities, but exists in the space between them, the triangle (see Figure 1) provides a way to address the research practice through drifting trajectories, looping or shifting dimensions, etc.

![Design Research Triangle](image)

Figure 1: Design Research Triangle connects design practice, exploration and studies as researcher drifts in various ways (loops, trajectories, dimensions) through these activities. Figure adapted from Fallman (2008).

The main three activities are now briefly described.

**Design practice** can be described as a generative and synthetic research practice where the researcher becomes an integral part of a multidisciplinary design team working on a real-life library project, not primarily as a researcher or observer, but as a designer. This is to say, the researcher takes an active part in the hands-on design work of sketching, constructing and building artifacts and prototypes, dealing with time constraints and communicating and negotiating with fellow team members. Thus, the researcher, alongside library employees can build an appreciation and understanding of the tacit knowledge and competences involved in a professional design practice. However, unlike a professional designer, the researcher approaches the process “with an explicit design research question in mind, or with the clear intent of forming such a question from their activities” (Fallman, 2008, p. 6). It is important to mention that the research question does not have to align with the direction and goal of the design interventions, but can be formulated to focus on particular issues or themes that are relevant from a research perspective. In this case, for example, the intervention’s goal may be to create a new service, but the research aim is to inquire into tools, meaning creation, ways of thinking etc., which support gain of design capabilities and understanding of design thinking.

**Design exploration** is synthetic and proactive, involving the researcher in a reflective, hands-on process of exploring designs and constructions of prototypes. These activities revolve around the researcher’s own research interests, where “the most important question is: What if?” (Fallman, 2008, p. 7) Design exploration intends to experiment, question and provoke critical reflection on the current state of the world, and to imagine possible, alternative and preferred futures. “[D]esign exploration is a way to comment on a phenomenon by bringing forth an artifact that often in itself, without overhead explanation, becomes a statement or a contribution to an ongoing societal discussion” (Fallman, 2008, p. 8). In the context of this paper, the research explorations were centered on how design interventions should be designed so that the learning is re-enforced by tackling different real-life issues. Each intervention outcome was intended to serve as a road to becoming aware of larger, more complex issues, values and notions that the library can engage in through gained skills and understandings.
Design studies is the type of design research activity “that most closely resembles traditional academic disciplines” (Fallman, 2008, p. 9), where the goal is to build upon and contribute to a cumulative body of knowledge. This requires an analytical engagement with design theory, methods, history and philosophy, as well as theories and approaches from a variety of other disciplines. It also involves presenting and publishing research outcomes in academic conferences and journals. “[U]nlike design practice, [design studies] seeks the general rather than the particular, aims to describe and understand rather than create and change, and because of that often appears as distancing to its character rather than involving.” (Fallman, 2008, p. 9) Design studies, in the context of this paper, highlight concepts that emerged through the process of implementing the interventions as the most important ones for gaining and maintaining design capabilities.

The role of the triangle is not so much about the positioning of a particular activity, but the way in which it enables reflection and discussion about how RtD researcher moves in between the three activity areas, thus providing concepts that describe movements, such as trajectories, loops, and dimensions. Trajectories are either intentional or unwanted drifting between research activities. They enable discussions about the perspectives and directions of a particular research activity, how the outcome of the activity may feed into another activity and “what kind of quality measures, guarantors, and stakeholders we will face when moving in between different activity areas”. (Fallman, 2008, p. 11). Loops are trajectories without start and endpoints, signifying an ability to freely move back and forth between the two, and in some cases all three, activity areas. Thus, activities in different activity areas feed into each other, iteratively driving the research forward. Finally, dimensions infuse the triangle with meaning by creating conceptual continuums and tensions between the activity areas.

All these concepts have been useful in describing the research process regarding design capabilities within an academic library through interventions. The interventions were made with a clear intent of performing designerly work and allowing the challenges, both the learning ones and the ones related to appropriateness of methods and tools to emerge from activities and engagement of participants in any given intervention. Each intervention required engagement in design practice prior to the intervention (for example, designing and making context specific card sets, worksheets, or other objects to be used during the intervention to engage the participants in rapid prototyping), during the interventions (by participating in whatever design activities were a part of the intervention). Design explorations required a focus on research intent and exploring different ways in which design capabilities and practices could be supported through an intervention, as well as performing explorations under each intervention together with other participants. Design studies, in line with traditional understanding, served the purpose of generalizing findings from individual interventions and framing of research contribution to the body of knowledge that addresses how an organization, such as an academic library, develops design capabilities over time. Epistemologically, the triangle postulates that concepts and ideas have to be tried and explored to demonstrate their validity, in line with Dewey’s position that knowledge and theories are active phenomena “that are formed and reformed” during an inquiry (Biskjaer & Dalsgaard, 2012).

Constructivist learning

Building design competences by applying design thinking in the library context had to do with ways of organizational learning. The approach to learning that was implemented in the context of the library was based on real-life problem solving, through an experiential and constructivist approach (Jonassen, 1999; Kolb, 1983). In fact, while articulating how learning was implemented, the Beckman & Barry’s (2007) model that combines design thinking, innovation and learning styles (see Figure 2) was re-discovered.
Figure 2 - Beckman and Barry's model that integrates design thinking, innovation and learning styles. Figure: from (Beckman & Barry, 2007).

Figure 2 is rather self-explanatory. Design thinking process is shown in the left bottom image, iterating between the synthesis and the analysis, the concrete and the abstract when moving from understanding the context towards solutions. The top image on the left shows different thinking styles. These are explained in relation to design thinking phases in the large image on the right, which depicts the integrated model.

While engaging participants in intervention activities in the library context, attention was paid to shift between divergent and convergent thinking, concrete and abstract, allowing the time for dialogues and assimilations, synthesis and learning from concrete experiences.

The case: design interventions in an academic library

During the course of this research, 16 design interventions were carried out. They grew increasingly complex over the period of four years that this research took. Interventions can be divided into three groups in accordance with what research aims were. The first set interventions (4) all focused on service design as the aim of the intervention (innovative services, or improvement of the old ones), as well as organizational learning (vocabulary for service design and design thinking) through experiential engagement in the intervention, exposing participants to different thinking styles and thinking through rapid prototyping. The mid-period interventions (9) also focused on services, but were tackling more complex issues that were of importance for the library at the time when they were performed. During this period, some library employees already got engaged with the approach, and it could be said that became knowledge-brokers for design thinking in the library (Pandey & Srivastava, 2016). The last set of interventions (3) was related to three large projects, two of which are still going on. These interventions were strategic, deeply engaged in envisioning of the role of the library in the future. To provide flavor of these workshops, one representative intervention from each group is presented.

An example of early interventions

The intervention presented here was a workshop with 25 participants. Seventeen participants were library employees, including leaders, librarians, digital service employees, and open access consultants. Four participants were graduate students in interaction design and four were researchers. The participants were divided into four multi-disciplinary groups to discuss searching for e-books, which was a real life issue at the library. The activities were hands-on. Each team got their deck of service design cards, and other typical workshop items, such as colored pens, dots, and a large sheet of paper (see Figure 3, left and center). The participants took some time to become familiar with service design concepts and tools, especially cards. Cards were quickly recognized as an excellent tool, facilitating the building of common understanding of the problem space. Soon, all groups started also using arrows and dots to reason by assigning importance to specific cards or processes, and mapping out present and future customer journeys while searching for e-books. Design
thinking was an approach, at least in the simplified format in which it was presented, that all could easily understand and use to solve the problem at hand.

The outcome of the workshop was, for the library employees, the understanding that service design uses a design thinking approach and tools such as customer journeys and touch points between library users and the library. Alternative customer journeys (prototypes of future services) were easy to visualize using service design cards (touch points cards). One of the lessons was related to the understanding that through synthesis of experiences from diverse suggestions of future customer journeys, inferring and discussing the best solutions may lead to design of better services.

The research aim was how to best introduce design thinking and build interest, motivation, engagement among the library employees by considering the selection of the intervention aim (a small, manageable one at first, such as e-books search, yet related to the real organizational need) and the use of tools that are appropriate for the purpose. The team work facilitated fast learning and constructive dialogues. Attention was paid to the number of participants within the team (in this case, 6-7 per team) in relation to the engagement and equal opportunities for all to actively take part in the process. The level of openness of tools emerged also as central (Culén & Gasparini, 2016; Culén et al., 2016) already during this first intervention.

In the subsequent three interventions in this first group, we used different sets of cards, to explore the different effects on participants when tools were directing behaviors, were too open, somewhat structured, or fully structured. Other layers of openness also became visible, establishing openness in tools, processes and mindset and a main theoretical concept to be explored.

An example of mid-period interventions

This example is an intervention concerned with the use design thinking in order to improve web services for the library, as well as the coordination between different departments maintaining the web pages. The goal was also to envision a common strategy for dealing with web-services across all departments. The intervention comprised several workshops and was organized in collaboration with the Communication Department at the University of Oslo Library. All participants were web-editors and different workshops had different number of participants, ranging from 7 to 10, most participants took part in more than one workshop. Since participants by now were familiar with design thinking processes, the tools changed. Communication exercises, design thinking exercises, mind-mapping and Giga-mapping (see Figure 3, right image) became central, and were based on real library needs (apart from the communication exercises such as writing a break-up letter, and others that were picked up to support the processes). Materials such as large paper sheets, post-it notes and colored pens were provided.

The outcome of these web-service workshops (constituting a single intervention to improve processes around web-page maintenance) for the library was a draft of the common strategy that all could agree to. In the aftermath of the workshops, it became evident that the participants in this intervention managed to integrate the design thinking approach in their daily work practices, implying that they have indeed succeeded in developing some design capabilities. They demonstrated this this indeed is a case by using the new gained skills and ways of thinking to organize different events and services entirely on their own.
From the research perspective, exploration of how to support dialogues continued. This now became conceptualized as *dialogical spaces* and is described in more details in the discussion. The emergence of these spaces was fostered by using and shifting between different tools (again, in accordance to constructivist and experiential learning, Figure 2). The participants showed routinized behaviors when using tools, that is, familiarity with both processes and tools. Temporal aspects were now brought to the foreground of research inquiry into integration of design capabilities and designerly practice with everyday work in the library.

**An example of the most recent interventions**

A new department at the university, and the physical space to house it, was under planning since 2016. In the initial plans, the library was given only a small place to perform the traditional library functions. The intervention, comprised of two workshops was carried out to change this outcome strategically. The workshops were initiated by one of the library leaders, along line with other knowledge-brokers in the process of organizing the intervention. The first workshop had the aim to discover opportunities for the library that could be fronted, and through which the library could support the needs of the new department in new ways. The second workshop focused on an even broader question: "*What should the University do to be known as a place for convergence and innovation? How to create room for innovation, and innovative thinking in the new department?*"

Eleven participants took part in the first workshop, from different departments of the University, and one architect. The second one had 14 participants, all with different backgrounds, aiming to create truly multidisciplinary teams. Participants were in research leadership positions (6, in charge of research groups), a dean, a student representative, employees from different departments, interaction-design students and two library employees.

During the first workshop, people used ethnographic methods and tools (walking tours with photo-documenting). The second one used a whole range of tools – cards to make newcomers comfortable and open for dialogue, customer journeys and touch points to understand the approach to service design, Giga-mapping and other mappings to discuss the complexities and layers of needs in the new building, see Figure 4.

![Figure 4 - Wall from the second workshop showing different design tools used, such as the affinity mapping, and customer journeys (Photo: Gasparini).](image)

The outcomes for the library could be summarized by what the leader of the library who initiated the workshops said: design capabilities, skills and understandings of the processes gained during earlier design thinking interventions allowed her to envision how to use different design methods to position, in the difficult arena of political negotiations for the space and presence in the new department, the new values of the library. The design approach used during the two workshops helped the participants understand that the library could be a much larger stakeholder in the building than they previously realized. Using the design thinking approach in these two meetings, the library managed to change its position from being almost marginalized to be the party responsible for innovation and creative thinking spaces in the new department.

For the research, this represented the point at which the interventions could be stopped naturally. It confirmed very clearly that the understanding of design thinking at the organizational level was now deep enough and powerful enough to serve also the strategic purposes. The leadership and the knowledge-brokers have gained competences that they could use in complex contexts, and to meet new challenges. Temporal
aspects of the processes became of central interest, whilst different aspects of openness could not be clearly seen, as well as how it influenced creation of dialogical spaces that last within the organization.

Discussion

As common when engaged in research through design, the basic way of gaining new knowledge was through reflections in actions during each intervention, and reflections on actions post intervention. In practical terms, after careful planning, possibly design of cards or other tools, piloting the intervention, in action, every step was evaluated anew. For example, even if tasks were carefully timed, interesting processes and discussions were allowed to continue even if the allocated time was over. Also, many different aspects, such as team work, quality and quantity of ideas etc. were always ongoingly evaluated during interventions. Reflections on action allowed for establishment of new explorative pathways that were deemed optimal towards continuing to build in-house design capabilities. They also helped in recognizing important theoretical concepts that facilitate processes of adoption and integration of new practices in everyday work.

The three core concepts (openness, dialogical spaces and temporalities) that emerged as central through the research efforts are now discussed.

Openness

Several layers of openness became visible in these processes. Openness to change implies willingness to observe and identify opportunities for design in everyday work. It also requires the willingness to periodically evaluate the effects of using design thinking, as well as consider other ways in which it can be used, towards building of design capabilities. Openness to learn and acquire design skills and competences was also important, but did not necessarily apply to all employees. As long as some library employees were willing to become knowledge brokers, in-house competences could be maintained, and built further. However, it was remarkable that nearly all employees wanted to learn, and participated in at least one of the interventions to gain the understanding of design thinking processes. Keeping in mind Beckman & Barry’s (2007) constructivist and experiential learning model, oscillation between the concrete and the abstract, as well as reflections and actions, was important to keep people engaged and open to learning. Openness to proto-practices relates to the willingness to integrate new ways of thinking and working with already established practices and processes. Openness to be a part of a multidisciplinary team work, where dialogical spaces and creation of truly shared knowledge, was important. It is directly related to individual’s behavior and experiences in team-work settings and people’s willingness to adjust personal behaviors and expectations from personal to project based ones, to take the full advantage of the diversity of competencies.

At a different level, openness to research collaborations, that is work with other researchers and designers engaged in similar research and practices, fostering positive collaboration to explore building of design competences, was of importance to increase competences of knowledge brokers and understanding of tools used to communicate design thinking processes.

When discussing tools, the understanding of openness of tools emerged as a very important one. Most of the tools, such as diverse card sets available on the market, have structured approaches so that novices can use them with some gain. Alternatively, they are open for interpretation and require facilitation by professional designers, to address their tacit knowledge and sensibility. One of the main findings from having been involved in the processes of building in-house competences has been that semi-open structure work best. In other words, using tools that allow creativity instead of limiting it, but that support well both divergent and convergent thinking and enable broader research and wider inquiries into the problem space were the best to use. In addition, such semi-structured design tools were found to support various forms of communication and emergence of dialogical spaces well.

Dialogical spaces

Developing dialogical spaces, design vocabulary, and the project vocabulary, in line with findings from (Krippendorff, 2006) and (Boland, Collopy, Lyttinen, & Yoo, 2008, p. 14), were shown through this work to be of paramount importance for building and sustaining design capabilities and understanding of design thinking processes in an organization such as the academic library. What we have seen is that the design thinking approach and the tools, different at different stages of assimilation and capabilities building, supports the creation of a dialogical space where a common understanding is created. The real-life solution-aimed activities supported well the reflective learning (Beckman & Barry, 2007; Schön, 1983). However, dialogical
spaces, both the physical ones (created for each intervention so that people could easily engage in creative activities, move and talk in different constellations was always facilitated) and the mental spaces in which participants could feel safe, and share knowledge, stances, and ideas freely were essential property of the process. Next, we found that playfulness was important in the dialogical space, as it supports team interaction and invites people to a more relaxed communication with each other. Often, tools to be used in an intervention were selected just for their power to support dialogues, speculations and criticism (where relevant) but through playfulness.

Regarding the physical aspects of dialogical spaces, the territory where they take place is important. Places chosen for interventions mediate the character of the event (for example formal or informal), level of care for the event (careful preparations, availability of all needed materials, preparation of cases to work on and more), level of intimacy (the size, coziness and other properties) and so on. In the dialogical space physical proximity of participants, as well as activity spaces are both important and some personal routines may be challenged. To be in the same space for duration of the intervention is important for dialogical spaces. When appropriate, informal spaces for dialogues could also be created, such as during lunch or coffee breaks.

In summary, the term “dialogical spaces”, reflects the concept of both physical and mental spaces (supporting possibly multiple dialogues within the same space) in which a cross-disciplinary design projects take place. Dialogical spaces shape the project language and introduce the design vocabulary to newcomers to design processes. Through careful choice of physical spaces, using constructivist and experiential learning (sharing of concrete experiences, abstracting together, etc.), supported by adequate design tools, like Giga mapping (see Figure 3, right image), learning is speeded up, and new understandings of project-relevant knowledge emerge.

It is also important to note that, when concerned with building of design capabilities, knowledge brokers continue these dialogues by integrating them into their regular work-practices. They are thus always available to others, to engage in dialogues around possible new projects or areas of application for their design capabilities.

**Temporal aspects of building design capabilities**

As noted above, this part is rather mundane and part of the common practice when planning interventions, workshops or other activities involving people who dedicate their time to come to the activity. During the entire project, no participants were paid for their work extra (the library employees did the activities during the normal working hours, and had their regular pay, all others volunteered their time). Thus, the return on time investment needed to be thought of. It turned out that most participants, if novice, were happy with the learning process, and if experts, with sharing knowledge in a real-life and meaningful setting, usually with people who were quite engaged. Making sure that each intervention had some form of concrete outcome, even if not immediate, was an important return on time investment.

It can be said that the first group of interventions was an orientation phase, using the term as in Karapanos et al. (2009) that describe temporal aspects of processes, becoming familiar with design thinking and the ways of using it. The second group of interventions was corresponding to the incorporation phase, through prolonged use of the new practices. Finally, the last interventions can be said to represent the identification phase, demonstrating how designerly ways of thinking and working have become meaningful within the library.

Between interventions, especially the more complex ones, integration of gained knowledge, changes in the mindset, or in practices, needed to be allowed some time. This kind of temporal perspective are really little understood, because they can be subtle and unnoticeable for those who are not a part of the organization (connecting back to the importance of insiders and knowledge brokers for the development of design capabilities). How to support and how much time to dedicate to these processes? If new participants attend different events within an intervention, as was the case with later ones, how to save time related to establishing dialogical spaces, and the orientation phase? The findings here indicate that selecting knowledge brokers here too, is necessary (or, at the minimum, there should be some overlapping participants who can speed up the learning processes for the newcomers). Equally important, deciding what ideas and possible solutions should be discussed further, what solution trajectories to choose when implementing, was also interesting from the time perspective.
Remarks on learning and participation

Although the portfolio of interventions was diverse, they all focused on integrating design thinking and building of design capabilities in the library. Some have taken concrete, simple projects that, seen in isolation, are not of a large significance. However, seen jointly, as re-enforcements of learning how to act in designerly ways, they do address macro management of time. Distributing these smaller, manageable and possibly inspirational projects across the timeline of the overall project kept re-enforcing the learning.

In the light of previous research, especially the poor ability to sustain design capabilities (Malmberg, 2017), the creation of a design language based on the vocabulary used during projects was of paramount importance. There are many examples of how the library staff used their design capabilities. For instance, one subject librarian, long after this research was done, when working together with the faculty from another department at the university, used design methods to engage with the following questions: What makes a research paper a good one? and What does a PhD student need to do to get to have a good one? After mapping the problem area, they created a number of different user journeys, charting the territory from an assignment to a successful paper. This example shows that the subject librarian continued to be open to design methods, successfully remembered design vocabulary and explained the user journeys to others, creating a common dialogical space along the way. The subject librarian also could articulate the time perspective more clearly, leading to the better understanding and implementation of the collaboration on this particular case.

Since projects were diverse, people were always open for new learning and participation. As mentioned earlier, many library employees have participated in multiple interventions. Repetition and diversity of interventions were hugely important factors for building capabilities over time. There was no prescribed number of interventions that had to be done. Instead, the momentum built by one intervention and the interest it generated were used to organize the next one. In this process, the attention was paid to not have them too close to each other so that they do not become burdensome, but close enough that they can build on the outcomes of the previous ones. Between these, the library leadership could use the time to evaluate and appropriate the skills. With time, they developed the ability to notice the design opportunities. As described in the most recent intervention example, it was the leader who was the initiator of the intervention. This was a marker that incorporation has indeed taken place.

In summary: a practice-oriented approach, research through design, utilizing experiential learning, and a pragmatic approach and especially the Dewey’s notion of inquiry, aiming to approach a non-defined situation and try make it thinkable (Dewey, 1909, p. 108), has been a suitable way of introducing design thinking and building of design competences for the academic library. Real-life problems, solved through design thinking and in the context of experiential and hands-on learning, were crucial. In addition to repetition, as a learning strategy, what motivated people to engage, and keep them engaged in design thinking processes, were dialogical spaces and openness. Allowing time for assimilation, integration, evaluation and emergence of proto-practices, also played an important role.

I close this section by providing guidelines, rather than recipes, on how to work with capability building and design thinking in complex organizational settings of academic libraries.

Guidelines

Based on the outcomes of this study, some simple guidelines are provided on how to work with design capability building and design thinking in complex organizational settings of academic libraries.

1) Start by providing introduction to design thinking and service design, using compelling examples of real-life library issues, to the leadership (have in the back of your mind the ways in which people learn (Kolb, 1983) and use concrete real-life library problems to so that people can relate them to experiences that they already have).

2) Systematically work on increasing and building design competences. This can be accomplished by using knowledge brokers, someone who has design competences to start with, or is willing to learn in order to facilitate systematic building of competences.

3) Use, at the very start, simple activation tools, such as cards. Then increase the complexity of both problems and tools used gradually. Changing tools, and choosing ones that are suitable for the issue at hand is important. Tools like cards, Giga-mapping, semi-open templates and workbooks are very helpful.

4) Use a lot of thought on how to facilitate emergence of proto-practices, but allow this organic process to unfold by itself. It may take time. After some time, people (as a collective) either pick up new practices and add to the old, or do not.

5) Pay attention to dialogical spaces, and keep them active even between interventions. When someone in the organization shows interest for the approach, take time to help (or design a help service for the approach).
6) Repeat and refresh whenever possible. Be very pragmatic about this. Nothing should be imposed, overdone, but also not underdone.
7) When engaging others in multidisciplinary process, pay attention to the choice of people that make up the team. Having positive and competent participants, who are communicating easily, is good. However, paying attention to thinking styles, the knowledge and competences that participants have is also important.
8) Knowledge brokers need to keep developing their own competences (exploring, experimenting and reading about the approach, tools, teams, practices, etc.). It is an advantage if someone in the leadership evolves into a knowledge broker.

Conclusion

Concluding, RtD offered a good, hands-on, exploratory, and reflective way to engage with the inquiry regarding development of design capabilities in the academic library. Engaging in a series of sixteen design interventions through practice – oriented approach that utilized real-life problems and experiential learning, gave insights into how design competences can be developed in an academic library. Some of these insights were articulated as guidelines that can be explored and followed when building design competencies is desired. At the more abstract level, concepts of openness, temporality and dialogical spaces emerged as foundational to understanding competence building.

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References


