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Creating a home for experiential learning – a case study of an interdisciplinary product development course

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Abstract

This paper presents an action research-based study on how a new learning environment was co-created with its users to support an interdisciplinary product development course, and how the new space supported the experiential learning method used in the course. The data consists of field notes collected during a three-month intensive development phase and of nine semi-structured open interviews. The results reveal that the new learning environment became a home base for the students, and illustrate how informal events organized in the space increased the feeling of togetherness and decreased barriers for communication. The new learning environment became a comfortable place where the students were able to combine work and fun, interact with other students, learn from others and relax.

Keywords: learning environment, experiential learning, co-creation, physical space

1 Introduction

Facilitating change through physical space, introducing collaborative ways of working, and challenging the traditional workspaces is nothing new in the organizations of the 21st century. However, universities and schools have remained somewhat conservative with their learning spaces, even though we acknowledge how physical spaces can impact our everyday practices – including teaching and learning. The need for redesigning learning spaces is based on the growing interest to develop experiential and non-theory-based learning (e.g. Laakso & Clavert, 2014). These forms of learning (Dewey, 1938; Vaughan, 1991) set new challenges to the classrooms where learning takes place, as the focus extends to how we are learning beyond just what we are learning.

A change in education and teaching practices is called for, as today's graduates, regardless of their discipline, need skills that help them tackle complex challenges that cannot be solved with rational and straightforward ways (Dewey, 1938; Laakso &

Clavert, 2014). Particularly when working with complex development issues in which the problem and solution co-evolve (Dorst & Cross, 2001), students need to skills such as learning to proactively redefine initial problems (Björklund, 2013) and promoting their ideas to the variety of affected stakeholders (Björklund et al., 2013). Many of these skills could be considered as *design thinking*, a concept that has expanded far beyond the traditional realm of design (cf. Hassi & Laakso, 2011). Experiential learning can provide tools, methods and capabilities to support solving complex challenges, but as learning is not separated from the environment where it takes place, the environment should enable teamwork, communication and interaction. However, this is often lacking from lecture halls designed for traditional Cartesian approach of teaching (e.g. Brown & Adler, 2008; Dewey, 1938; Laakso & Clavert, 2014). In this paper we present how space can be used as a medium to create a student-centric, holistic, learning experience with soft skills as explicit learning objectives. Such environments exist in multiple universities around the world. Some of these spaces, e.g. d.school were benchmarked and used as inspiration for the development of the Loft. However, we do not compare the spaces in this paper, instead we focus in describing the process and its outcomes.

1.1 Environments for experiential learning

Experiential learning describes learning, which is not theory-based, teacher-centered, or an individual's sole endeavor (Dewey, 1938). It emphasizes experiences in learning and sees education as a social process where experiences develop through interactions that can happen anywhere (Dewey, 1938; Kolb & Kolb, 2005). The concept of experiential learning is not new, but still it is not embraced to its full extent in higher education. In experiential learning the traditional views are challenged not only in perceptions of teaching and learning, but also in interactions taking place, hierarchy, attitudes, and the physical spaces where learning takes place.

Physical space plays a significant role in shaping human social interaction and supporting collaboration, and it should be acknowledged that experiential and meaningful learning can not just occur anywhere (Graetz & Goliber, 2002). For example traditional classrooms do not encourage students to participate in genuine conversations and students might not get experiences that increase their curiosity and hunger for learning (Dewey, 1938; Kolb & Kolb, 2005). A functioning learning environment should increase learning in the community and allow continuous change at the same time as it supports hands-on learning and facilitates creativity and its manifestations in action (Leifer & Steinert, 2011).

Learning is much about feeling and thinking, and especially reflection enhances learning (Kolb & Kolb, 2005). Hence, modern learning environments should be comfortable, safe, supportive and afford both active engagement and interaction (e.g. Kolb & Kolb, 2005; Weinstein, 1981). In addition, they should enable informal learning beyond the teacher and the classroom, where people share experiences with others, participate to activities around real-life problems, and where mentors help novices to become experts (e.g. Brown & Adler, 2008; Laakso & Clavert, 2014).

1.2 Rules pervade space

There are several rules all around us which we have learned or which are communicated to us explicitly with signs and signals (Cresswell, 2004). People create meanings and rules in spaces, and practices in a certain place are not fixed – places are not born with certain natural and obvious meanings (Cresswell, 2004) but instead the meanings and rules are created in a social context. In educational institutions there is often distance and hierarchical relationship between students and teachers that is injected into the spatial design and seating arrangements (Cresswell, 2004; Hebdige, 1979). Such spatial decisions, whether made consciously or unconsciously, have been set well before even knowing what kind of activities are going to be built inside and what kind of interaction should the space enable (Hebdige, 1979). Authority has been built to the system through space (Cresswell, 2004).

This hierarchy, or a narrow view of suitable classroom-behavior can be challenged with the development of the new learning environments and new practices. However, there are several challenges, since the hierarchical structures which maintain the status quo, are based on the traditional model of teaching and learning (Bickford, 2002). We are used to a certain type of classroom, but what if the space looks and feels different? Suddenly we have to evaluate how to behave, what can be done and what is not acceptable behavior. This could be defined as an *out-of-place experience* which means that the actor is acting against the code of conduct and “not matching the expected relations between place, meanings and practice” (Cresswell, 2004, p. 104). Experiential learning gives more freedom to the learner to articulate and reflect their experiences, instead of expecting the learner to follow strict rules in a formal classroom setting (Dewey, 1938). This flexibility needs to be reflected in the learning environment as well to make the most of the approach.

1.3 Change in practices requires a change in physical space

Traditional classrooms “make perfect sense to students who expect to sit quietly and listen to a lecture” (Graetz & Goliber, 2002, p.15). However, if the teacher wants to change the behavior and practices in the classroom without doing any physical modifications in the space, it might cause primarily negative feelings in the students, since the physical space has not been designed to support interaction and team working (Graetz & Goliber, 2002). Thus, if we want to change the interactions taking place in a classroom, the physical space should be also changed accordingly. When creating a new physical environment, that supports collaboration and “brings affordances in line with student impressions” encourages the teachers and students to adapt new rules and ways of working (Graetz & Goliber, 2002, p. 16). New activities in a traditional physical space can produce negative attitudes, feelings and unwanted behavior if the space and the desired way of working are not aligned (Cresswell, 2004), whereas a new space can give an opportunity for all the stakeholders to interact beyond traditional norms (Cresswell, 2004) and engage teachers and students into new kind of interaction and learning.

1.4 Research setting and goals

This paper discusses a project to create a new learning space to support experiential learning to a traditional engineering university setting in Graz University of Technology (later TU Graz) in Austria. TU Graz had a 100m² rooftop office at their disposal, which they wanted to transform into a flexible, interactive and fun working environment for an interdisciplinary Product Innovation Project –course (later PIP). The course did not have a designated space nor did they have any shared, interdisciplinary, creative spaces such as design studios. Based on field notes and nine interviews, this study aimed to identify interplay between the physical, social and mental learning environment in promoting student-centricity and shifting from traditional ways of working towards experiential learning. Our aim was to study whether the new space supported experiential learning, specifically whether the physical space facilitated new ways of working and if so, what kind of ways. The study did not evaluate the learning outcomes or compare them to earlier years.

2 Methods

The study presented is descriptive and qualitative. The data collection focused on how the users perceived the space, what kind of interactions took place in the new environment and what kind of new practices did the space enable. The data was collected using participatory action research. The role of an action researcher can be described as a helper, consultant or facilitator (Eriksson & Kovalainen, 2008; Gummesson, 2000), and in this case the first author was to act as an external facilitator in the project in addition to conducting the study. Action research was chosen because of its approach that aims both at taking action and creating knowledge about that action (Coughlan & Coughlan, 2002; Reason & Bradbury, 2006) while the researcher takes part in the change process.

Action research is a cyclical three step process of planning, taking action, and evaluating the action, which leads to further planning and new actions (Coughlan & Coughlan, 2002; Eriksson & Kovalainen, 2008). It is crucial that the action is done in collaboration with the researched community and that all outcomes are allowed to happen, meaning that both intentional and unintentional outcomes can occur, and the organization and the researcher should learn from both of them (Eriksson & Kovalainen, 2008).

2.1 Data collection

The data builds on nine semi-structured narrative and reflective interviews conducted in April 2014 with four student project managers and five faculty members of the PIP course. These interviews were supported with field notes and a daily diary documented with participatory observation collected during an intensive three-month development period from the start of October 2013 to the end of December 2013.

In this case the action researcher covered the phases of planning and taking action during the three-month intensive development period and evaluation continued through the interviews and by following the activities remotely. Further evaluation and cycles of action research were left to the local organization to carry out without the participation of

the researcher. Several smaller iterations of the cyclical process were carried out during the three months, where experiments were planned, evaluated and tried out.

2.2 Data analysis

The data was analyzed qualitatively by searching for critical incidents from the data and categorizing shared topics from people’s stories in order to understand the influence of the new environment better. However, the goal was not to generalize the everyday descriptions, since in action research the research case is always unique and a complex whole of the context, interactions and environment (Eriksson & Kovalainen, 2008).

The comments and stories were classified to themes describing either the physical, social or mental space. The field notes and observations were used as a lens for the classification process. Later categories were formed under these themes based on recurring topics (see table 1). Students’ (later S) and faculty’s (later F) answers were kept separate. Repeated topics were identified from the interviews and those topics were used to identify stories and incidents from the field notes to support the interview data.

Table 1. Categories resulting from data analysis.

Physical space	Describing the Design Loft
	Developing the space together with the users
	Attractive and comfortable space is inviting
Social space	Value of being present in face-to-face interaction
	Events and activities bring people together
Mental space	Mental space, an opportunity for new practices and ways of working

3 Results

The data shows that the students’ perceptions of the development differed from those of the faculty’s. Students emphasized their own projects and teams, whereas the faculty looked at the big picture and talked about the PIP course in general. However, similar themes and topics came up from all the interviews in both groups. These topics were related to interaction, informal events, possibilities to work differently, help of an external facilitator and the affordances of the new physical space. The new physical space played a big role by providing a home base and a new kind of working environment for the PIP students. Furthermore, the environment was also identified to enable especially faculty-student and student-student interactions and collaboration.

3.1 Physical space

3.1.1 Student and faculty descriptions of the new physical space

Both the faculty and the students described the purpose and activities of the new physical space, called the Design Loft (later Loft). Faculty focused especially on the flexibility of the space, talking about the Loft as a home base and a place for the students, and

emphasizing the nature of a creative environment and its differences compared to traditional lecture rooms.

“They (students) have their own space 24/7 where they can meet, that’s not happening somewhere else. It’s like an identity. They feel [at] home [...] they have space to be without asking permission, they can do their own thing.” (F5)

The main users of the space, the students, described the space through their practical experiences. They were more practice-oriented in their verbalizations, and for example did not mention abstractions such as ‘creative’ in their descriptions. Instead, they emphasized how they could both work and relax in the Loft and spend time there, not only during coursework.

“...it’s an office, or I say that it’s a flat actually, that we have a kitchen, rooms, we can work and also meet there, which is very important. [...] It’s kind of a funny office.” (S2)

The faculty also described how having a designated space for PIP and even minor modifications and changes made it look and feel totally different.

“I was here in June last year seeing the Design Loft, or let’s say the offices, and seeing it now it’s really a difference. What for me was really surprising was that it’s not that much stuff in here, which is new. [...] I don’t feel that it’s completely new everything and still it’s completely different feeling if you enter the Design Loft.” (F1)

3.1.2 Descriptions of developing the space together with the users

The students described being pleased and happy to have been engaged to set-up the new space and being able to take part. They developed a feeling of ownership to the space early on, as a result of taking part in the planning process.

“I liked it because then you feel a little bit that it’s also more your project and that you can also say that ok I’m working in this room where we, were part of it developing it. [...] you feel more like home.” (S3)

The faculty did not emphasize developing the Loft, most likely since they did not take part in one of the main shared co-planning workshops.

3.1.3 Descriptions of the space as comfortable and inviting

Both students and the faculty members brought up in their interviews how a space that affords everything from working to fun, as well as anything from individual work to interaction, was a place where people wanted to spend their time. The Loft was found to be colorful and comfortable, which made the people want to come to the Loft and spend time there. In addition to comfortable environment, other people and opportunities for interaction were also frequently mentioned as a positive addition. However, the space could have been used even more, as due to University policies not all course students had access to the space or found the location ideal.

“...typically you go to the university, you work there and then you go home as soon as possible. But if you come here (the Design Loft) you are working and having a beer and that’s another type of working.” (S4)

3.2 Social and mental space

3.2.1 Value of being present in face-to-face interaction

Both the observations and the interviews emphasized the value of interaction and having people around. Especially people, who were available, and who could help and support ones’ work was seen valuable. Students would have liked to be more connected to the faculty in order to get more information on the upcoming deadlines, events, and course practicalities and they frequently utilized encounters with the faculty in the Loft to clarify practicalities and questions they had. The students hoped to have more peer presence at the Loft, describing how that would have made the place livelier. According to the students, the faculty did not spend that much time at the Loft, which the students interpreted that as ignorance towards the project.

“I liked that very much that when I came here that people were here. Before, at the end of the year you were here and you were kind of the lead person or something and also our communication partner to the institute, and after this, in January, February there was nothing or, bad communication and not really meetings. For example today (having a meeting about the gala preparations), this was again very nice and many people meet together and we didn’t have this the last weeks or months.” (S4)

Also the faculty noticed how their presence at the Loft was noticed and that the students utilized the situation for asking different kinds of questions. One faculty member noted that the barrier to ask a small but important question face-to-face was a lot smaller than calling someone. They also mentioned how seeing the students, and being at the Loft was a reminder for them to talk about important topics related to the course. Faculty was clearly focused on the course when they were at the Loft and seeing the people triggered communication and information sharing.

“I think it’s very important and you need to be present at the office. You need the physical contact to the students. Because when you meet them and ask them ‘do you have problems’ of course they say ‘yeah, ok that’s the problem’ but when you don’t meet them they never write you an email or call you, they try it on their own. It’s easier for them to get in contact.” (F3)

Despite the untraditional encouragement for how to behave and interact, the Loft was not separated from larger context. The prevailing culture in people’s minds was still the university culture – the way people were used to interact, work, and behave in a university environment. The fact that the faculty was officially grading the students was partly perceived as a barrier for open communication.

3.2.2 Events and activities bring people together

Even though the Loft was described as comfortable and positively different place to be and work, these features still were not sufficient to bring e.g. the faculty frequently to the Loft. To change this we introduced some events in the Loft, to enhance the feeling of togetherness and increase information sharing especially between the students and the faculty, and across the PIP teams. These events and activities such as communal breakfast and seasonal celebrations gave the users a reason to come to the Loft.

“It’s also a chance to talk with the other teams, how is it going in your projects, do you also have the problem that this and this... I think it’s also good that the communication is still going on across the teams and not only within the team.” (S3)

“...this just chatting is an opportunity to find someone who helps me solving a problem I’m not able to. To help me find another solution. So I think this communication, knowing what others do leads to many positive following effects.” (F4)

Coming together also helped working and communicating, as familiarity increased the feeling of togetherness and team cohesion. After having met others, it was easier and more comfortable for the students to work together, ask questions, and share the working spaces. In addition to the fun and informal gatherings, the Loft also enabled the students to prototype and conduct user testing. The Loft was a neutral setting for organizing co-creational prototyping, since all the necessary equipment, space and people who were willing to help could be found there.

“Our team building was really cool [...] get to know all the people. [...] Then if you meet him next time at the office, you know him. It’s not a stranger.” (S4)

3.2.3 Mental space, an opportunity for new practices and ways of working

Even the incremental changes in the physical environment, that used to be an office space and the changes in practices, had an impact on the atmosphere. The spirit, enthusiasm, and feeling of the space were clearly different from what they had been before, and also different compared to traditional lecture rooms.

“They (the students) are not here for the ECTS, its something else you can't see. I can see it in the faces of these people, there is great spirit!” (Professor of TU Graz, field notes)

“I like the atmosphere in the office, that we have here a place to work and that the meetings are not that official, rather informal and also that you can eat during the meetings.” (S4)

4 Discussion and conclusions

Studying the role of the physical space in transitioning to experiential learning, we investigated what kind of new ways of working a new physical space (the Design Loft) afforded and brought with it in an interdisciplinary product development course. The

results show how knowing the people around you builds togetherness, a common space can break down barriers for communication and how informal events and gatherings create value for different stakeholders.

In accordance to earlier research (e.g. Kolb & Kolb, 2005), the current study shows spaces for experiential learning should be comfortable and support creativity. This study shows how the Design Loft was a nontraditional learning environment; flexible, inviting and comfortable, where people enjoyed spending time both for course work and for free-time activities. Central in experiential learning is that learning happens in interaction with other people (e.g. Dewey, 1938) since a significant share of learning happens outside of the classrooms, when people get together in e.g. cafeterias and apply their knowledge with each other (Matthews et al., 2011). It was clear that the Loft afforded interactions and the physical proximity of people created opportunities for communication. The events and gatherings organized in the Loft increased the feeling of togetherness. However, activities and unplanned interactions are unlikely to happen if the users do not have access to the space. Unfortunately not all students had the ability to access the Loft at any time, which influenced the frequency of spending time there.

Location can be another limiting factor for using a space. Design Loft was not in a location where students or faculty would accidentally walk by, since it was located in the top floor of a separate building, a few minutes walking distance from the institute. Hence, visits to the Loft were intentional. We see that this increases the importance of organized events where people get together as they provide a reason for coming. These gatherings can then result to unplanned conversations and unexpected interactions.

As research shows it has been less traditional to involve students and teachers to the process of redesigning classrooms (Van Note Chism & Bickford, 2002) even though they are the stakeholders who are most aware of the challenges and limitations in the traditional classrooms (Bickford, 2002). This study shows that involving the students to the development of the Design Loft made the space familiar and approachable to them early on. However, our findings reflect that it would have been important to involve also the faculty to the development process to make them more engaged to sustaining the activities and further development of the Loft.

It is important to take into account how the students perceive the environment when developing learning environments – there are social and psychological elements that cannot be ignored (Weinstein, 1981). Design Loft was a totally new kind of learning space in the context of TU Graz and PIP course and as it did not resemble a traditional classroom. There were no norms or pre-learned rules of how to work and use the space. Thus, the learned norms and rules of a traditional classroom did not apply and the space afforded its users to adopt a different state of mind. This provided an opportunity to introduce new practices to the Loft, which would e.g. lower the hierarchical barrier between the students and the faculty, and support the students' work with fun and inspiring environment.

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