BALANCING DESIGN PROJECT SUPERVISION AND LEARNING FACILITATION

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ABSTRACT
In design there is a long tradition for apprenticeship, as well as tradition for learning through design projects. Today many design educations are positioned within the University context, and have to be aligned with the learning culture and structure, which they represent.
This raises a specific set of demands to the design lecturer. On one hand she is the facilitator of the learning process, where the students are in charge of their own projects, and where learning happens through the students' own experiences, successes and mistakes and on the other hand she is a supervisor, who uses her experiences and expertise to guide the students' decisions in relation to the design project.
This paper focuses on project supervision in the context of design education – and more specifically on how this supervision is unfolded in a Problem Based Learning culture.
The paper explores the supervisor's balance between the roles: 1) Design Project Supervisor – and 2) Learning Facilitator – with the aim to understand when to apply the different roles, and what to be aware of when doing so.
This paper represents the first pilot-study of a larger research effort. It is based on a Lego Serious Play workshop, where both design lecturers and design students participated. The study implies in short that: design project supervision is most requested in the early semesters whereas learning facilitation is requested in the later semesters. Further the study implied a number of focus point for the supervisor to be aware of when applying either of the two roles.

Keywords: Design supervision, problem based learning, lego serious play

1 INTRODUCTION

Before industrialization there was no formal design education. Design at that time was a skill of trade and craftmanship, which was learned through apprenticeship. Even in the first formal design educations the tradition of apprenticeship was carried along, in the sense that students worked very close with their masters [1].
Today, many design educations are positioned within the University and compliant with the learning objectives, culture and structures, which are found here.
In the specific context of this study, the design education (M.Sc. Eng. in Industrial Design, Aalborg University) is placed at a university where all educational programs are based on Problem Based Learning [2]

1.1 Problem Based Learning (PBL)

Problem Based Learning (PBL) is pedagogy, which emphasise practical and experimental learning. Students learn by solving complex problems with no single correct answer, and by reflecting on their experiences [3]. PBL help students become active learners and become responsible for their own learning, because their learning is situated in self-selected real-world problems [4],[5]. According to Hmelo-Silver [6] the goals of PBL is to help students 1) construct an extensive and flexible knowledge base; 2) develop effective problem-solving skills; 3) develop self-directed, lifelong learning skills; 4) become effective collaborators; and 5) become intrinsically motivated to learn.
In the design education at Aalborg University the application of PBL means that the students work in project organized teams, where they identify complex or ill-defined problem i.e. in a specific user context. After this they unfold the problem through research and ideation on the solution, and develop a solution to the problem in the form of a product design (or service design). In this process, they

apply knowledge and methods from the semester courses, from previous experiences, as well as search for the knowledge or insights needed to solve the identified/selected problem.

However PBL is not just influencing the student project and working method, it also influences the supervisor's role and approach to teaching.

1.2 The supervisors role in PBL

In PBL the supervisor is a facilitator of the learning process, rather than an expert on the content itself. She is an expert learner, who provides strategies for learning and thinking [6] According to Hmelo-Silver, *The PBL facilitator (a) guides the development of higher order thinking skills by encouraging students to justify their thinking and (b) externalizes self-reflection by directing appropriate questions to individuals.* [7].

In PBL, the supervisor's job is to assure that the students go through the various stages of PBL. First the students needs to identify a complex problem are, and obtaining additional information about the problem are for instance by gathering facts, doing experiments or research [8]. This leads to a problem definition based on which the problem solving begins. In the problem solving process the facilitator encourages the students to pause the process from time to time, in order to reflect on the data and develop hypothesizes about the underlying casual mechanisms. This helps the students to identify concepts, which they need to learn more about and help them direct their problem solving.

After the task has been complete, the supervisor encourage the students to reflect on the lessons learned by working with this problem - in terms of collaboration, problem solving, and self directed learning etc. [6].

The supervisor is guiding the students through the process primarily through the use of questioning strategies [9]. This includes knowing when an appropriate question is needed and responding to the process, for instance if students are going off track or if the process is stalled.

In some respect the facilitator is monitoring the students' process, and assures that all students are involved and encouraged to externalize their own thinking as well as commenting on the other students thinking [10].

The supervisor's role is critical to the problem based learning process, especially with novice PBL students. However as the students become more and more experienced they take over many of the facilitator's roles and strategies.

1.3 PBL and Design Project Supervision

In some respects PBL is not far away from the way design and design education is and has been approached. Project organization, team collaboration and 'complex problem orientation' is recommended in various design literature [11], [12], [13]. PBL also corresponds with Schön's idea of the design process as a process of learning in it self, where designers use of models and prototypes, as instruments to learn about the design object [14]. However when it comes to the role of the supervisor there is a difference. As described earlier, design education is still based on an apprenticeship culture, where the supervisor uses her experience and expertise to guide the students' decisions in relation to the design project.

Even in a PBL University, it is possible to find design supervisors, who supervise according to the apprenticeship culture, or to find supervisors, who switch between the two roles of the Design Project Supervisor and Learning Facilitator.

This study is not trying to argue one way of supervising over the other, but rather looks at when it is constructive to apply the different roles, and what to be aware of when doing so.

2   THE RESEARCH SETUP

This study represents the first pilot-study of a larger research effort with the aim to understand design supervision in the context of PBL, and understand when it is constructive to apply the different supervisor roles (Design Project Supervision and Learning Facilitator), and the potential pit-falls in doing so. This calls for an explorative approach, which can open up some of the potentially interesting topics, and which can be used as a stepping stone for further research. It is therefore important that the research method will enable the key stakeholders in the supervision situation (the students and the supervisors) to bring forward some of their tacit and experience based knowledge.

In the search for potential research methods, LEGO Serious Play (LSP) is identified as potential method for facilitating the expression of tacit and experience based knowledge [15], [16] and consequently it is selected as a way to gain insights into the supervision situation.

2.1 Lego Serious Play

Lego Serious Play (LSP) is based on the seemingly simple idea of modelling with LEGO bricks as means of tapping into unconscious knowledge and communicating this knowledge through narratives [17]. In practice LSP is a facilitated workshop, where the participants are asked different questions in relation to a project, task or strategy. The participants answer these questions by building symbolic and metaphorical models of their insights in LEGO bricks and presenting the models to each other.

An essential part of the LSP workshop is the democratic, non-judgemental, free-thinking, and somehow playful interaction between the participants [17].

The development of the LSP has been an ongoing process. Most of the effort has been devoted to developing applications to facilitate strategy-making, however recently there has also been development into the area of team dynamics and finally LSP has been used as an alternative educational tools in primary schools.

2.2 The data collection

In the context of this study, LSP was used as the framework for a workshop including 6 master students and 4 supervisors. First the group was introduced to the concept of LSP through a number of small skills-building exercises. This was followed by an exercise where the students modelled representations of their own role in the student projects, and where the supervisors modelled representations of themselves as supervisors.

And finally the participants were asked to build a model, which represented the supervision situation, when it does not work. The different models were discussed and all participants were asked if they were able to recognize the issues, which had been modelled in order to validate their relevance and prevalence. And finally each model was discussed in relation to the two supervisor roles: 1) Design Project Supervisor and 2) Learning Facilitator.

3 ANALYSIS AND FINDINGS

When analysing the different statements and discussions at the workshop in relation to aim of the workshop, it was clear that there were some interesting topics, which could be used as stepping stones for further research.

3.1 Balancing Design Project Supervision and Learning Facilitation

First of all, in terms of balancing between the roles of the Design Project Supervisor and Learning Facilitator, both students and supervisors agreed that the need for the Design Project supervisor (with active interference in the design process and the decisions in relation to this) is more distinct in the first couple of semesters, because the students at this point needed an introduction into the field of design and the culture/values in design.

In the later semesters, it was found that there is a greater need for the 'learning facilitator', in order to support the design students' own ability to manage and accomplish the design process.

However, it was agreed that it all depends on the students, the projects and the specific situation. As one of the students commented: *'Sometimes you are just faced with a wall, that you cannot get over or around – not matter how hard you try – and in these situations you need the supervisor to help you (the team) make the appropriate design decision'*

3.2 Focus points as a Design Project Supervisor

In relation to what the supervision should be aware of, when applying either the role as the Design Project Supervisor or the role as the Learning Facilitator, the explanations of the models and the following discussion, also revealed some interesting topics.

One of the potential pitfalls, which was mentioned in relation to the Design Project Supervisor is the tendency to arrogance in the communication and lack of explanations to why one decision is better than another *('It is right because I said so'- mentality)*. This limits the potential learning situation and leaves the students with very little knowledge about design decisions as well as a very distant relationship to the supervisor (see figure 1)
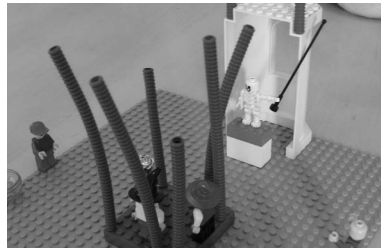
According to one of the students (who is also working as a career guidance counsellor) this is especially problematic in the first couple of semesters, where the students are very focused on fulfilling the wished of the supervisor. Instead of demanding explanations behind the supervisor's advices or questing their chances of learning from adopting the supervisors advice, the students tend to just do what the supervisor says - in order to get a good grade. According to the career guidance counsellor, the reason behind the students' reactive attitude is that in the first semesters of university, the students still carry the paradigms from High School (in Denmark: Gymnasium), where grates (to the students) seems to be much more important than actual learning.

Another potential pitfall, which emerged in the discussion of the Design Project Supervisor, is the supervisor's tendency to apply personal visions or interests to the students' projects. Some of the students shared stories, where a supervisor had tried to add his or her own visions or interest into the projects for instance by setting up special demands to the project or by continuing to suggest certain directions for the project – even if it had been rejected by the students multiple times.

And finally one of the pitfalls the students mentioned in relation to Design Project Supervision was the tendency to inconsistency in the supervisor's attitude to the design. Even though, the students are aware that the supervisor's attitude to a design project will changed along with the development of the design, some students still experience this as quite frustrating. Especially in relation to examination, some students had experiences that the supervisor's attitude changed completely - from positive in the supervision to negative in the examination.

3.3 Focus points as a Learning Facilitator

The first thing, which was discussed in relation to what a supervisor should be aware of when applying the role of a Learning Facilitator is the potential distance to the project and lack of engagement in the problem situation, because she is trying not to take ownership in the project. One of the students exemplified this by a supervisor's on-going suggestion of different methods - without evaluating the value of the different methods in relation to the project or without discussing the reason why it for instance does not work (co-reflection). This left the student in a very unsatisfactory situation and they lost confidence in the supervisor's commitment to the project.

A second pitfall, which some of the students had experienced with supervisors in the role as Learning Facilitators was the supervisor's experimentation with the students learning process and the feeling of being guinea pigs. This was underlined by stories where supervisors tried to push the students framing of a problem or encouraged them *'to be wild'* without any supervision on how to get them back on track afterwards. In the specific case it had limited the students confidence in exploring and making mistakes.

The third thing, which both students and supervisors pointed to as an important thing to be aware of when entering the role of the learning facilitator is the ability/maturity of the students to receive this kind of supervision. It was underlined that if the student does not have their own wish to learn something or take their project in a certain direction, it is very difficult to do supervision as a Learning Facilitator. One of the supervisors even described this as the worst-case scenario for Learning Facilitation (see figure 2).

Figure 2. Worst case scenario (from a supervisors point of view): 'Students with no initiative and drive (empty shells with no arms), who wants the supervisor to make decisions or approve directions in the project (…) the students wants to break the division of ownership (…)

4   CONCLUDING REMARKS

As the analysis and findings chapter has shown this pilot study has been able to point to some quite interesting topics, when it comes to understanding the balance between the two supervisor roles: Design Project Supervision and Learning Facilitation – in a design education at a PBL University. The study implies in short that: Design Project Supervision is most requested in the early semesters where as learning facilitation is in the later semesters. Further the study implied that when applying design project supervision, it can be beneficial to the students, if the supervisor is 1) explaining the background for guidelines and advices on design decisions 2) being careful not to apply any personal visions, interests or working approaches in the students projects and 3) aiming at being consistent, when it comes to own opinions about the design. And finally the study implied that when applying the role of the Learning Facilitator, it is beneficial to the students, if the supervisor 1) tries not to become distanced/disengaged with the student's problem situation 2) limits any kind of learning experimentation 3) and is aware of the students ability/maturity to receive this kind of supervision.

The implications from this study are not to be seen as beginning conclusions, but rather as areas/ interesting topics for further research. The empirical basis is simply not strong enough for more than that. However besides being the data for this study, the workshop also proved to be a learning experience in itself. It enabled both supervisors and students to see the situation from the other side of the table and reflect on their own actions and interaction from that perspective. It created a match of expectations and nuanced communication, which hopefully could help both supervisors and supervisors to avoid some of the pitfalls mentioned in this paper in relation to the two facilitator roles: the Design Project Supervisor and the Learning Facilitator.

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