

# Accessing new skills through the making process

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## ABSTRACT

In this paper we are reflecting on a three weeks project that was about approaching unfamiliar tools, machines and materials through making. We are investigating how the engagement of designers within open spaces and in particular in the interaction with new tools and machinery, can open design possibilities or constraint creativeness.

In the following we will analyse how new practical knowledge affected our thinking and creative processes and how our professional backgrounds influenced our experiences.

The prototypes developed during the project functioned as mediators for accessing unfamiliar design areas. The making process unfolded into an ongoing negotiation between us, the tools and the material that informed the iterations of the prototypes.

Based on the reflections of our experiences we identify three angles on gaining new knowledge through prototyping: *Adapting procedures*, *Shaping design decisions*, *Gaining access through experts*. They can function as inspirations for others when approaching unfamiliar making processes.

## Author Keywords

Research through making; prototyping; co-designing; collaboration; practical skills

## INTRODUCTION

We are four Master students with different professional backgrounds. We have been working together in a three week project trying to explore how the engagement of designers with various tools, materials and making processes can open new design possibilities or, eventually, constrain them. We have been actively engaging in the exploration, improvisation and variety of requirements for design procedures. In this way we investigated our curiosity as direct participants [4]. As participants we had very different expertises. Inspired by the approach of

Participatory Design that takes advantage of the “explicit competences” [1, p.103] and practical skills of the different members in a group, we

used them as rich resources through the designing and making process. We were approaching machines and tools with a particular viewpoint, based on our expertise, but at the same time it was our priority to exchange skills, expertises and experiences with each other.

Our aim was to push ourselves into the process of *making*, trying to access knowledge beyond our professions and background knowledge. As we experienced ourselves, it can be challenging to use unfamiliar tools or explore new materials for the first time. We wanted to push ourselves into new explorations and try to get rid of the boundaries that come along with previously gained knowledge. Within the process we identified three angles on approaching new practical skills, which are described at the end of this paper. We propose them as a suggestion for designers that are accessing unfamiliar hard skills and considering unexplored areas of making for the first time.

## PROJECT SET UP

We divided our project time of three weeks according to the rooms in the available workshop facility of our university. Each week was dedicated to one room. Firstly, we approached the sewing room, secondly the digital fabrication room and thirdly the wood workshop.

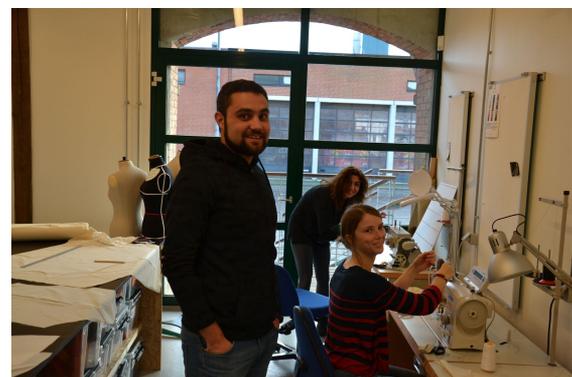


Figure 1: P3, P1, P2 (from the left) working in the sewing room

## Different expertises at hand

Our group consisted of four participants that had the following backgrounds: one had studied

Furniture Design and Wood Technology (P1), another studied Fashion Design, Business and Technology (P2), the third had a background in ICT Engineering (P3) and the fourth participant had a Bachelor in Communication, Languages and Cultures (P4). This variety of expertises enhanced the development of different power relations of the novice and the expert, “the weaker” [4,p.2] and, as a consequence, the empowered. According to Norbert Elias, this power, which is characterized as “interdependency”, makes the relationship of the individuals both constrained and dependent on each other [4, p.2]. These relations continuously changed depending on the amount of previously gained expertise in using some of the machines or tools.

### Recognizing and exchanging roles

During the first week in the sewing room, it was clear from the beginning that P2 felt very comfortable in using the machines as P2 was approaching the room based on previous background. P2s’ role immediately changed from being a participant into being the facilitator and teacher for the other participants.

Following, the approach to the second room was mostly a collaborative process as our knowledge in using the digital tools was on similar levels. The activities and the responsibilities there were equally distributed. During the week we used a “co-design” approach, meaning that we combined “the creativity of designers and people not trained in design” [5, p.2] working out how to approach the design development process together.

The last room we engaged with has been the wood workshop, where P1 had the role of the facilitator. She was sharing her knowledge with the other participants and taught them to use a variety of woodworking machines.

### PROTOTYPES AS MEDIATORS

The aim of the project was to learn how to use the tools and the machines *through the making* of prototypes outside of our comfort zone. The prototypes served as mediators to gain new practical knowledge and expertise. Each participant was working on a prototype in each room. Our processes were identifiable with Schön’s concept of “reflective conversation with the materials of a situation” [6, p.79]. Hartmann specified this as the “interactions between designers and the design medium” [3, p.8].

During the process of designing and prototyping novices and also experts would most likely get

surprised by the behavior of materials and machines. Such a moment of surprise “talks back” [6, p.79] to the designer and enables him or her to gain new perspectives, knowledge and comprehension of materials and prototypes. Understanding the machinery and failing while using it, enables iterations and a constant *conversation* between the two.

### Reframing ideas through Informed by practice

Making different kind of artifacts for the sake of gaining new skills was motivating us as “reflective practitioners” [6, p.295] both towards “reflection-in-action” [6, p.49] and “on action” [6, p.276]. When facing problematic situations we would reframe *in action*, while making, our next move, enriching our learning process [6] and afterwards we had the chance to *reflect upon* the happened situation. We could look back on the experiences in order to discover how our previous knowledge may had contributed to an unexpected outcome or to face a specific situation [6, p.26]. In this way we were able to research through our practice context. Each project was an evolving construction of a unique case that we were co-creating.



Figure 2: P4 experiencing a woodworking machine for the first time

### ANGLES ON THE MAKING

During our process of approaching unfamiliar practical skills, we were able to see behavioral patterns emerging among us. In the following we will propose them as suggestions for designers that want to access new tools, machines and materials through making. These angles are highly informed by our individual case, but

might not be seemingly transferable to every other unique case and group of participants. Therefore we see them as openers for further discussion.

### **Adapting to new procedures**

Approaching unknown territory, for example for a furniture designer using fabrics, concluded in re-accessing well known patterns from the own area of expertise. One example took place during the week in the sewing room. While P1 was cutting fabric, she did a mistake and cutted off too much. When P2, the expert in this room, saw it and told her she would have to re-do her work, P1's response was: "Can't I just glue the two fabric pieces together again?" When reflecting "on action" [6, p.276] it is obvious that she was approaching fabric in a way she would approach wood, her area of expertise. She used it as a source for defining her actions when entering the unfamiliar field. Glueing pieces together when cutting wrong, is a solution that originates from the working procedures in a wood workshop but does not apply to working in a sewing room.

When approaching new tools and materials it might become the first strategy to reuse knowledge one has through working in other areas, but we had to learn that working patterns cannot be always easily transferrable in between wood, plastics, fabrics, visualizing programmes, etc. Previous knowledge in working with particular materials or tools can constrain the first steps into a new practical area of using unfamiliar machines, as it might conclude in failure or frustration. One should adapt to procedures and sequences of working accordingly to the tools and materials at hand to get more satisfying results.

### **Shaping design decisions**

Unwillingly, the more one becomes an expert in certain techniques, the more one will use the acquired knowledge in earlier stages of the concept creation. P3 claimed: "Now that I know how to use the sewing machine, I will avoid to use certain materials for future projects. For example, elastic materials - they are tricky."

This is a clear demonstration that the more we were engaging with materials, the more we were starting shaping our thinking based on our new knowledge.

P3's "reflection on action" [6, p.276] took the event of using the elastic materials into considerations, the difficulties he had when using it and resulted in the reframing of possible future actions. Similarly formed capability, reached

through the making, enables designers to foresee problems and possibilities before starting a project and during the making of prototypes. At the same time neglecting materials and tools that were challenging to use in past experiences, will prevent a designer from developing advanced skills with the more difficult materials.

### **Gaining access through experts**

In each workshop room we identified one expert that appeared to be more fluent with the tool and materials. We would discuss our ideas with those we would recognize as experts, before starting to engage with the machines. Having an expert when approaching unfamiliar machines enables novices to gain access to insight knowledge that opened new possibilities. For example, when P4 was entering the sewing room, she was planning to make several items in one week. P2, the expert, evaluated her plans as "too ambitious". With initial skepticism P4 slowly started understanding how much time is required to approach machines for the first time. This understanding influenced her project choices, as they became less risky.

When approaching a room for the first time, we felt more than once the drive to immediately get into action. This drive is what Dewey refers to as "the blind impulse" [2, p.69]. To re-dimension it into a more "mature purpose", the observations and judgments of the more experienced participants were fundamental. Abstract and creative ideas during the making process became more concrete and the complexity of the idea was re-dimensioned to a more feasible one under the advice of the experienced participants. The advice of an expert can also appear constraining to more ambitious ideas or unconventional approaches of a novice.

The collaboration of novices and experts also opens new possibilities for the experts, as it can address what Schön identified as "Technical Rationality" [6, p.21]. Many experienced practitioners end up at a certain point locked in automatized practices and over time they become afraid of exploring new ways of approaching problems [6]. By creating a fluent exchange between experts and novices, experts can see their area of expertise in a new light and gain new understanding of existing working patterns.

### **CONCLUSION**

In the end of the project, the prototyped outcomes represented our accomplishments, the knowledge that we gained and the way the

specific situation formed our capabilities of embracing the unknown. Our approach of entering unfamiliar contexts as a group, yet as individual designers, resulted in a continuing shift of roles among the participants. Depending on previous skills, knowledge and expertise, we were either experts or novices with different levels of power.

When approaching new machines or tools, the newly learned skills can function as constraints or openers. We propose them as angles on the making process. They can be seen as suggestions for designers, that want to widen their horizon beyond tools or materials they already know based on their studies. By accessing materials and tools that do not seem matching their own profession, designers would be able to access a richer set of possibilities for future projects and prototypes. The three angles we define do not have to be necessarily all present in the process of gaining new knowledge through making, but can give an impression on how one might adapt to an unfamiliar area more easily.

While identifying them, we previously described critical observations related to different constraints each angle might bring with its application. We addressed these constraints as openers for further discussions and research on the topic.

Through defining both the openers and the constraints of accessing new skills through making, designers can enrich their thinking and design processes. Furthermore they would be enabled to expand their already familiar set of expertise with innovative approaches.

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