Facilitated Articulation of Implicit Knowledge in Textile Design

Anne Louise Bang, Kolding School of Design, Denmark, alb@dskd.dk

Abstract

This is a report from an ongoing research project and as such it is work in progress. The paper proposes an exploratory approach in order to enable end-users to contribute with their experiences of emotional values of fabrics in use. It is suggested that the textile designer with her repertoire of (experiential, implicit and tacit) textile design knowledge should facilitate the articulation process. The paper specifically draws on a series of workshops conducted within the collaborating company inviting all employees to participate. The series of workshops were based on a game-like setting and introduced an emergent framework for accessing implicit knowledge in textile design. The framework is based on the distance to the fabric. Present at each workshop were materials, chairs and images as initiators for articulation. In each workshop rules for playing and gaming materials were introduced by the author – being a textile designer herself, who functioned as the facilitator. This paper uses two examples from the series of workshops to exemplify a facilitated articulation of implicit knowledge in textile design. From the examples the following themes are synthesised as being important for articulation: The hands-on experience as initiator for articulation; the game-like setting including rules and gaming materials as a facilitating set-up; and finally feeling as experts enables the participants to contribute and articulate their experiences. In future exploratory workshops it is suggested to elaborate on an introducing, an exploring and a summarising phase in order to work more in-depth with articulation and contribution to the design process.

Keywords
Emotional values, articulation, textile design, exploratory approaches, design process

This ongoing research project is conducted in collaboration with a Danish company within the textile industry. The company develops and manufactures fabrics for upholstery, fabric solutions and related services. The research project has a strong relation to design practice – the author being a textile designer herself, and it has a special interest in investigating, exploring and defining emotional values of fabrics in function. The overall research purpose is to contribute to the generation of explicit knowledge in textile design.

An assumption in the project is that companies working with an extended value chain – offering e.g. fabrics on rolls, fabric sheets ready for upholstery and upholstery suggestions – can benefit from an active involvement of various stakeholders and end-users in the design process in order to develop as well as refine their offers to their customers e.g. furniture manufacturers. The question is then: How can the textile design practice meet and benefit from other peoples personal and individual experiences of textiles?

The research project proposes exploratory approaches as a way for the industrial textile design process to handle emotional values such as sensuous qualities and aesthetic appeal which are hard to quantify and immeasurable (Brand, 1964; Hatch, 2006). This paper specifically draws on a series of workshops conducted with employees – which were considered as end-users, from the funding company.

Implicit knowledge in textile design

Articulation of implicit and sometimes tacit knowledge is seen as a first step on the way of involving non-designers in the textile design process. Articulation is considered a premise for verbalisation, dialogue and mutual understanding which again are premises for an open-ended discussion and an in-depth design process.

As stated within textile science (Hatch, 2006) there is no reliable method for the quantitative evaluation of hand qualities in textile science even though it is "often the fundamental aspect that determines the success or failure of a textile product" (ibid: 53). There are several words attached to hand qualities and "these words do not have the same meanings to everyone who uses them" (ibid: 53). Nevertheless words are – also in textile science, considered an important research tool for what is called a subjective evaluation of fabric aesthetics in textile science (Brand, 1964:791).

When it comes to soft and immeasurable aesthetic properties such as e.g. surface appearance, colour, and hand qualities the textile designer is the skilled practitioner responsible for approval. Schön (2001) introduces the terms knowing-in-action and reflection-in-action to describe a practice based problem solving opposed to a technically based problem solving. Knowing-in-action should be understood as the kind of knowledge that is revealed in the way we conduct tasks whereas reflection-in-action is what happens when a more or less unexpected problem is addressed in action. The processes are to some degree conscious but not necessarily verbalised. Addressing various, unique and often complex everyday tasks a textile designer draws on her technical knowledge as well as her experiential knowledge – in Schön's terminology her "repertoire" (Schön, 2001:124). A thorough knowledge about materials, techniques, use and signal value forms the basis of the textile designers' knowledge on textile means. Cultural references, personal experience, and trend and market research substantiate the knowledge. In her communication the textile designer uses a mix of visual and verbal means exemplified by samples and prototypes. A subtle sensibility to textile characteristics and properties is acquired through design practice, craftsmanship, and functional and aesthetic experience (Bang & Nissen, 2005).

Textile designers are skilled practitioners in designing fabric structure and fabric aesthetics as well as they are concerned with the ways the fabrics apply to product and context. They are also familiar with project management and coordination. In industrial design and manufacturing they collaborate or communicate with various other professionals such as engineers, technicians, logistics staff, marketing staff, salesmen and management in order to facilitate and contribute to the design and development process in all stages from research of ideas to mass production. Besides this they also collaborate and communicate with customers, suppliers and end-users.

An emergent framework

Being considered as the expert it is not always necessary to explicate your knowledge and experience during the development process. But in situations working as an expert among other experts the case is quite different. Being an expert it is highly important to explicate issues on debate whether it is articulated and explicated by words or by other means.

The matter of distance

In this project the distance to the textile forms the basis for an emerging framework considering how to access implicit textile design knowledge. Basically it draws on Austrian art historian Alois Riegl's theory on perception (Bek and Oxvig, 1997). According to Riegl the observer's position to the actual piece as well as the character

of the perception is of importance for the perception. Riegl operated with three distances: the close up/detail (Nahsicht), the normal distance (Normalsicht) and the long distance (Fernsicht) and two main characteristics of perception: a haptic and an optic view (Bek & Oxvig, 1997:46).

The close up/detail indicates a relatively short distance between object and eye, a distance where it is possible to get only a partial view of the object. At a close distance even three-dimensional objects appears as surfaces, since it is not possible to watch the form giving shadows. According to Riegl the close up/detail are linked to a haptic perception which covers tangibility and tactility.

From a normal distance the form giving shadows are visible. At this distance the object can be seen as a whole and also the surface details are visible. This distance is haptic – the detailed surface appearance, as well as optic – the object as a whole.

From a longer distance the form giving shadows will disappear and leave only the most intense shadows as dark areas. From this distance the shadows appear as coloured surfaces but not as form giving areas. From the long distance the sight is linked to an optic perception which means that the objects appear as two-dimensional surfaces in a spatial context (Bek & Oxvig, 1997).

Transferring this to textile design the close up/detailed distance is comparable to the material sensation of the actual piece of fabric: structure and surface appearance. The normal distance is in this case the fabric as part of an object e.g. as upholstery fabric on an office chair. The long distance is the fabric/object in a spatial and signal value context such as an office in a company. The three levels of distance are illustrated in figure 1 below. The observations or experiences can be of: experiential as well as more formal/technical character.

Fig. 1: The matter of distance: Close up/detail, normal and long distance

An exploratory approach

Textile designers in the industry often work as part of multidisciplinary teams. Their ability of communicating and activating immeasurable properties of textile design is crucial for a team based in-depth development process and for the ability of end-users and other stakeholders to contribute to the design process.

What people say, think, do, use, know, feel and dream is different levels of experience that – on a sliding scale – are explicit, observable, tacit or latent. There are various ways to understand people's different levels of experiences and understanding is crucial in order to empathise with them (Sanders & Dandavate, 1999:88). In present research project exploratory approaches are investigated as a way for the designer to empathise with various stakeholders. In the preliminary phase of the project a pilot study using the repertory grid technique to investigate tactile sensations of upholstery fabrics and other flexible materials were conducted (Bang, 2007). One important finding in that study was that a variation of repertory grid actually functions as a tool for dialogue. Further studies have substantiated this finding (Bang, 2009) through experiments applying elements from the repertory grid

technique into cultural probes (Cultural probes e.g.: Gaver et al., 1999; Mattelmäki, 2006) and exploratory design games (Design games e.g.: Brandt, 2006).

Repertory grid embedded in a game structure

The repertory grid technique is a one-to-one qualitative interview technique originated in psychology. It considers the client an expert in his/her own life (Fransella, Bell & Bannister 2004; Kelly, 1955).

Especially the triadic difference which is an element from the repertory grid technique: "Presenting three elements at a time asking: 'How are two alike in some way, but different from the third?'" (Fransella et al., 2004:7) has been investigated as an exploratory approach for articulation in the actual research project. Working with the triadic difference a bipolar construct is elicited where two elements form one pole – the similarity – and the third element – the difference – forms the other pole. All elements explored can be scaled and judged according to the bipolar construct. Applied to approaches built over a game structure the triadic difference seems to enable the 'non textile design experts' who are considered to be experts in their own everyday life to articulate their experiences. Embedded in a game structure with rules and gaming materials it enables a facilitated articulation of about implicit knowledge in textile design.

Facilitated articulation

Study (Purpose)

This section gives examples from a study going beyond what people can spontaneously tell about their experiences with fabrics in function and what the observer can actually see when observing.

All employees within the collaborating company were invited as end-users to participate in a series of 6 games concerning fabrics in function. Being considered end-users they were invited as experts in their own (work) lives. Participating in "The game of the day" by solving different tasks they elicited words and statements as well as they chose and commented on images through various configurations of the gaming materials.

The research purpose with the series of games was to investigate if an exploratory approach could be appropriate for articulation of emotional values concerning fabrics in function. Furthermore the emerging framework "A Matter of Distance" as briefly outlined above was investigated as a model for how to access implicit textile design knowledge.

Study (set up)

The series of games took place in autumn 2008 as 6 workshops during lunch-time. People were asked to spend a couple of minutes of their lunch time participating in a game.

Each workshop included a hands-on aspect like sensing materials or trying chairs as well as various images played a role as game material. The 'game of the day' emphasised articulation of personal experiences either by judging or sorting images or adding keywords or statements to materials, chairs or images following rules for participation.

Building on the emergent framework the series of workshops took their starting point in fabric considerations (day 1 and 2) before scaling out to chairs (day 3), offices (day 4) and signal value (day 5). The final workshop (day 6) was a concluding workshop asking people to design an emotional barometer based on the previous workshops.

Participants and facilitaion

The participants were invited to participate in games focusing on upholstery fabrics, office chairs, offices and signal value. It was optional to participate and between 24 and 30 employees participated in each workshop. A rough estimate – made by the CEO, says that approximately 100 employees are working in-house each day. Participants were all kind of employees coming from stock, logistics, production, sales, service, it, design, quality and management. A few participants solved the tasks in small teams and some participants discussed their choices with colleagues before leaving the workshop.

As the facilitator my job was to plan and introduce the task of the day to each participant and to be the main dialogue partner if needed. During the week all 'answers' hang on the wall – as images and words – and each day flyers were distributed about the workshop to come. This is illustrated in figure 2 below:

Figure 2: Distribution of flyers and the wall presenting previous 'answers'.

Data

The data used for analysis is primarily the participants' configurations of game materials, words and statements.

Examples

This paper specifically looks into two examples from the series of workshops. This is due to the provided space in the paper. Furthermore these two examples are considered appropriate as eamples of facilitated articulation of implicit knowledge in textile design.

Example 1 – Material experience, words, triadic difference, bipolar constructs

6 boxes with materials were present in this game. As figure 3 shows they contained cut grass, wheat flour, pudding rice, a piece of rubber, a piece of cast plaster and a mix of feathers and down.

Figure 3: Materials used in workshop 2.

Two office chairs were present as well. As shown in figure 4 it was an office chair upholstered with a smooth black woven fabric and an office chair upholstered with fur dyed in a mauve nuance on the backrest and a slightly darker mauve woven fabric on the seat.

Figure 4: The two chairs present in workshop 2.

The participants were familiar with materials and chairs from the previous workshop where the task was to pick a material that felt similar to one of the chairs. After that the participants had to consider which type of material sensation they liked and which they disliked. This workshop functioned as an oveerall introduction to the series of games and the exploratory approach.

In the actual example from workshop 2 two piles of cards were present together with chairs and material boxes. One pile contained cards with an image of either the black chair or the fur chair. The other pile contained cards with images of the materials in the boxes.

Each participant began by choosing one of the chairs spontaneously. After choosing a chair the participant picked two material cards randomly. The task was then to decide – using the triadic difference, which material could be connected to the chair and which couldn't. As shown in figure 5 the participants sensed the materials in the boxes and then formulated their answers on writing on the images.

Figure 5: Material sensing and formulating poles in the bipolar construct

The participants were asked the following question: How are the chosen chair and one material similar as opposed to the other material? This formed a bipolar construct where one pole was a chair and a material and the other pole was a single material. The participants were now urged to articulate their choice by describing each pole with a word.

In this example the participants were urged to articulate bipolar constructs about material sensation according to an office chair. 28 people participated in the material workshop eliciting 27 bipolar constructs as listed in table 1 (translated from Danish to English by the author):

Pair (Chair and material)		single	Construct by chair and material	Construct by material
black	plaster	feather	Cool	Silly
	plaster	grass	Stylish, no nonsense	Too organic**
	rubber	grass	Nice, nice to sit on	Soft, a little resistance*

	rubber	flour	The colour, warmth	Cold
	rubber	plaster	Soft, springy	Hard, cold
	feather	grass	Soft and comfortable	This sense doesn't fit
	feather	rubber	Peacock	Cow
	flour	rice	Exceptional softness	Hard – also soft but in another way
fur	feather	rubber	Warmth, snug	Cold
	feather	rubber	The softness	Cold
	feather	grass	The softness	Hard and difference compared to feather
	feather	rubber	Airy	Massive**
	feather	flour	Soft, "long-haired"	Mute
	feather	plaster	The softness	Smooth
	flour	plaster	Inviting	Hard**
	flour	rubber	Soft	Resistance
	flour	grass	Soft in the same way	Another softness, stiff
	flour	plaster	Soft, comfortable	To hard for a chair, uncomfortable
	rice	rubber	Movement	"Blunt", compliant but with strength
	rice	plaster	Adjusts to the body	Stiff, hard
	plaster	feather	Smart	Too colourfull
	plaster	flour	Smooth, soft, nice to touch (the backrest)	Too coarse or rustic (fits the seat but the backrest is dominant)
	plaster	rice	Serene	Messy
	grass	rubber	Freedom	Vapid**
	grass	plaster	Furry, like fur	Cold
	grass	rubber	Fresh	Dull
	grass	rubber	Wellness	Emptiness**

* Elicited by 2 persons working as a team.

** The highlighted constructs were chosen for the task in example 2.

Table 1: 27 constructs elicited using the triadic difference.

Example 2 – Chair experience, scaling, preference, statement

7 different office chairs were present at the third workshop. In addition to the original two chairs – the black chair and the fur chair, I have searched the company for five additional chairs. As shown in figure 6 these chairs vary in upholstery and style:

Figure 6: the 7 chairs present in workshop 3.

The third workshop was based on the material experience using 5 constructs from the second workshop (highlighted in table 1) as a starting point for the chair experience. Among the 27 constructs 5 were chosen as ambiguous and open for various interpretation possibilities as shown below in table 2:

stylish><organic
inviting><hard
freedom><vapid
airy><massive
wellness><emptiness

Table 2: The 5 bipolar constructs used in workshop 3.

Each participant picked a bipolar construct randomly and the task was now to place the 7 chairs on a sliding scale according to the construct. They could try out all chairs since these were present in the canteen. The task of scaling all chairs to a randomly chosen construct forced the participants to investigate each chair in all possible ways before scaling them: e.g. look at them, try them, touch them and talk about them with fellow participants. Before leaving the workshop I asked each participant to tell me which chair he/she would choose and why. Almost everybody knew at once which one to choose – they felt familiar with the chairs after judging and scaling them.

In this case I didn't ask specifically for new words when the participants scaled the chairs. The results were articulated as images of the chairs scaled on a prefabricated form naming the poles in the bipolar construct. Instead I asked for a statement in the end of the workshop.

Each participant was asked to pick out a favourite chair among the 7 chairs and argue for their choice articulating a statement on an additional slip of paper. 24 people participated in the workshop about chair experience. The statements made were as follows in table 3 (translated from Danish to English by the author):

Bipolar construct		Chair	Statement
Freedom	Vapid	fur	Special, different
		black	Comfort
		red	The pattern, the colour
		red	Firm and good
Inviting	Hard	mesh	Comfortable and manageable
		chess	A good seat
		stripe	Comfortable. A short seat. Good support.

		red	Funny, light, fresh
Stylish	Organic	fur	Soft, comfortable and posh
		red	The colour, the pattern (embossing)
		red	It supports the back. The look. Stylish
		green	Comfortable. Classic
		mesh	It is the best designed chair
		stripe	Eye-catching, elicits 'joy' when I sit on it.
Airy	Massive	fur	Most unpredictable
		fur	Airy, comfortable
		mesh	The best lumbar support
		mesh	Good, you 'float' in it, soft and light
		green	(no answer)
Wellness	Emptiness	fur	Fur and combination. Posh, different.
		fur	Cool. Good comfort
		fur	Best comfort, bodily sensation
		mesh	Comfortable. Soft
		chess	Best comfort.

Table 3: Comments on the choice of favourite chair.

General remarks:

In the beginning the participants were hesitating, a little shy and humble. They doubted if they could come up with 'the right answer' and if their participation would be of any value. I put a lot of emphasis in answering them that it was very important and also useful if they participated since I considered them as experts in their own (work) lives and that 'the right answers' were similar to their specific answers because this was about personal experiences.

I also emphasised that this series of workshops were a pilot study in order to explore how other people can articulate emotional values concerning fabrics in function based on the emergent framework.

During the sessions they began to feel confident and even to look forward to 'the next game'. The series of workshops were received as a happy incident during lunchtime and once they decided to take part all participants were very serious in their comments. Once in a while it was very hectic with a lot of participants at the same time and at other times I had time to concentrate on just a few persons. Furthermore it was a funny, lively as well as educative way to communicate the research project within the company.

Findings

In the analysis I have looked specifically for articulation based on facilitation. Is the emerging framework "The matter of distance" a way to concretise implicit knowledge in textile design in a way so that other people through an exploratory approach can actually contribute with their experiences of emotional values of fabrics in function? During the workshops I acknowledged all articulation without asking supplementary questions. This was due to the very limited timeframe – people simply had to finish eating, participate in a workshop and be back at work within half an hour.

Material Experience

Going through the bipolar constructs formed in example 1 (see table 1) several of the elicited words are about softness (12 poles in 27 answers) or hardness/coldness (11 poles of 27 answers). In 6 instances softness and hardness/coldness are opposite poles in the same construct. The remaining poles are more airy and ambiguous or refer to other experiences such as 'nice to sit on', 'movement', 'messy' or 'dull'. One answer – which is cow >< peacock, is nothing else but odd for this author.

In this workshop the articulation were facilitated by a rule asking the participant to form a bipolar construct using the triadic difference asking: How are the chosen chair and one material similar as opposed to the other material? This clear rule and the provided gaming material as well as the materials and chairs present made it fairly easy to form the bipolar construct and elicit words describing the poles. However combining a chair with somehow odd materials was a challenge for some participants. As a facilitator I urged them to experience the chairs and materials in order to elicit the words. In the end all participants succeeded in eliciting words articulating their experience of the chair/material combination opposed to the single material (maybe except the cow><peacock statement).

As mentioned above a relatively large amount of the bipolar constructs in workshop 2 were about softness and hardness/coldness. I chose not to pursue this subject further because the purpose with the series of games was to explore the full scale of the emerging framework "A matter of distance". Clearly future work should look into softness and hardness/coldness in order to elaborate and refine on this seemingly important perspective when sensing materials as a part of objects (office chairs).

In this case I chose to continue using the 5 most ambiguous and open-ended bipolar constructs in workshop 3 about chair experience:

Chair experience

The reason for picking the most airy and ambiguous bipolar constructs from workshop 2 was that I wanted the participants to move from material sensation focusing on the upholstery fabric in function (on office chairs) towards the experience of objects including upholstery fabrics (again: office chairs but from another point of view). At the same time I wanted to show the participants how words articulated by some of them during one workshop could be of value in another.

15 of 24 participants mention variations of comfort as the main reason for choosing a specific chair. Eight of the answers are about other preferences such as colour or design. Finally one chose a chair but didn't answer the question why. In this paper I didn't look into the "image scaling" of chairs on the provided forms. In future analysis it would be obvious to consider how these rows of images can be understood as articulation.

The articulation of statements was facilitated by the image scaling task which urged the participants to explore the present 7 chairs thoroughly. The rule of scaling according to a bipolar construct was easy to understand and again for some of the participants – a challenge because of the airy and ambiguous bipolar constructs. To facilitate the process I urged them to explore the chairs and discuss their experiences with fellow participants. In the end all participants succeeded in defining the scale. None of the participants had problems choosing a favourite chair and state why (except from the one that didn't answer to that).

Concluding remarks

In this paper I have pointed out possibilities for end-users to articulate their fabric experiences accessing implicit knowledge in textile design through a framework

focusing of distance to the fabric. It is part of an ongoing research project and as such both the framework and the exploratory approach are work in progress.

Based on the above findings I have synthesised the following themes which I find is substantiated by the exploratory approach:

<u>Hands-on experience</u> or an "experiential experience" – based on sensing and experiencing materials and chairs is seen as an initiator for articulation of experiences.

Using rules to enable the participants to quickly feel confidence in participating and contributing and gaming materials such as materials and office chairs as initiators for articulation the series of workshops have given an insight in the potentials of an exploratory approach even though that the time limit were a hindrance for in-depth exploration. The <u>game-like setting</u> is seen as a tool for the facilitator in exploratory workshops.

Finally the acknowledgement of everyday experience as a valuable experience gives an <u>expert feeling</u> and is seen as a way as a way to build up confidence through the series of workshops.

Even though that there was a relatively high number of employees participating in an enthusiastic and serious way it is necessary to emphasis that making workshops during lunch breaks is not supporting for an in-depth and substantiated process since all participants are busy either eating or going back to work. In this analysis I therefore looked into possibilities for articulation more than specific and concrete results.

Finishing the research project by the end of 2009 the author seeks to contribute to future research by providing the framework "The matter of distance" as a way to access implicit knowledge in textile design. Furthermore an exploratory approach based repertory grid embedded in design games is seen as a way to activate the framework and enable stakeholders and end-users to contribute to the textile design process.

Future work

In the very near future (spring 2009) additional workshops are planned for the designers in the collaborating company. The purpose is further investigations of the emerging framework and the exploratory approach. In one workshop other stakeholders such as external sales people, buyers and end-users are invited to contribute with their experiences of emotional values of fabrics in use. The workshops will focus on office chairs which are a present in the everyday life of all participants: the designer, the sales people, the buyer and the end-user. The plan is to focus on three phases during the workshops. <u>An introducing phase</u>: clarification of the subject, rules for the game is introduced and a mutual understanding for participating is established. <u>An exploratory phase</u>: focusing on the subject through mutual understanding and collection of main data within an agreed time frame. A summarising phase: finishing the game, inviting the participants to contribute to an initial analysis.

Acknowledgements

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Anne Louise Bang, Textile Designer and currently a PhD Student at Kolding School of Design. The PhD project is funded as an industrial PhD in collaboration with textile manufacturer Gabriel A/S. The research explores emotional values of fabrics in a context. During the project Anne Louise has presented her findings at conferences such as Participatory Design Conference, European Academy of Design Conference and Nordes Design Conference. She expects to finish the PhD by the end of 2009.