

Materiality and Emotions in Making

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Design practice involves multifaceted activities related to creative processes involving various design tools and material. In the present exploratory study, we investigated the feasibility of using contextual event sampling as a method of studying design activities, materiality and emotions in the making process. 'Event sampling' refers to a research strategy for studying ongoing daily experience and emotions as they occur in the ebb and flow of everyday life. A novel method (Contextual Activity Sampling System (CASS)) was implemented for recording and archiving design behavior. The data were collected using mobile-phone technology employing a CASS query along with a diary method. We report two case studies conducted using CASS query (set of questions) that analyzed the socio-emotional experiences (i.e., challenges – competence) involved in the process of designing and handling materials during the respective design projects. In the first case study, we were interested in the main aspects of professional designers' work; resources they used, the social dimension as well as the emotional side of their work experiences. The purpose of the second case study was to examine, longitudinally, one textile artist's 'street art project'. The second case study is an example of autoethnographical research that uses CASS-query to document one's own creative practice. We conclude that the CASS technology has the potential for design research as it captures time-based and multimodal data from designers. The present study also recognizes some limitations of data collection. Methodological implications regarding the contextual study of design practices and ideas of the tool development are discussed.

Keywords: Design activity flow experience, event sampling, Contextual Activity Sampling System (CASS), feasibility

Introduction

Human creativity is well documented in all areas of art, craft, and design; these constitute essential aspects of our creative mind and activity, playing a significant role in culture and history (Boden, 1992; Csikszentmihalyi, 1997). Further, art, craft, and design education have an important role in educational settings from primary and vocational schools to universities. The focus of this article is primarily on those skills and activities commonly called crafts, i.e., work with various techniques and materials in the production of useful or decorative artifacts. Academic research on art, craft and design involves the analysis of these activities, as well as the creative processes and emotions related to them. In art, craft and design, visual and material artifacts and tools have a central role in mediating the thinking and learning processes.

Design processes and design thinking have been areas of intensive investigation for many decades, and it has been argued that design thinking is a distinct mode of knowing, one involving “designerly ways of knowing” (Cross, 2006; Lawson & Dorst, 2009). Design practice involves multifaceted activities related to working with various tools and materials. According to Visser (2006), design activity takes various forms depending on the type of design situation; specific forms are related to the designer, the artifact, and other task variables, which characterize the activity and situation (see also Cross, 2006). Design practice consists of a many activities; for example, designers seek inspiration and information inside and outside of their design projects, organize ongoing projects, meet customers and other stakeholders of the ongoing projects (Pedgley, 2007). The work of the designer is a mixture of individual work, asynchronous communication, face-to-face meetings, and interaction with design materials and tools.

There has been increasing interest in investigating design as a holistic activity that involves the designer, the design process, the design object and the design context (Dorst, 2008). According to Pedgley (2007), everyday design practice is extremely transient and difficult either to rigorously observe or recount. The challenge is to develop methods that are as close as possible to the activities yet not invasive of ongoing work (Pedgley, 2007). During the last two decades, art and design universities have contributed in this methodological development; artists and designers have opened up to the study of creative processes related to their own work (Mäkelä, 2003; Nimkulrat, 2009). Artistic-process-led and practice-led design research have emphasized autobiographical or autoethnographical research methodology relying on diary methods (Pedgely, 2007; Mäkelä, 2006).

At the same time, psychology and other social sciences have developed event sampling methods and diary instruments for repeatedly collecting information at specific moments in an agent's life (Csikszentmihalyi, 1992, 1996; Hektner, Schmidt, & Csikszentmihalyi, 2007; Shiffman, 2000). Event sampling is a generic term that refers to a research strategy for studying ongoing daily experiences as they occur in the ebb and flow of everyday life (Reis & Gable, 2000). By collecting real-time data of participants' actions, it is possible to examine how factors, such as perceived challenge and situational competence, interact or how their mutual relation develops across time (Csikszentmihalyi, 1992; Hektner et al., 2007). For example Csikszentmihalyi (1992, 1996) has developed the Experience Sampling Method (ESM) to study emotions related to everyday life. ESM uses a pager to signal people to fill out a booklet they carry with them; participants write down what they are doing, what they are thinking about, and rate their state of consciousness at the moment on a numerical scale (e.g., how happy they are or how they are able to concentrate). Based on these data and those from interviews Csikszentmihalyi (1997) found exceptional moments of people's life that he called optimal or flow experiences. Flow is a peak experience in which a person gets completely involved in the challenging task at hand to such an extent that he or she may temporarily lose all sense of time and place.

In current design research, there is growing interest in developing frameworks and research methods that capture data on a variety of aspects of designing in various contexts. As far as we know, event sampling that is based on a real-time data-capturing method (using multiple assessments of the participant's momentary state) has not been used in design research. In this article, we describe our efforts to develop the Contextual Activity Sampling System (CASS, Muukkonen, Hakkarainen, Inkinen, Lonka & Salmela-Aro, 2008) for capturing the multi-faceted nature of designing, the emotions related to design processes, and the role of mediating materials, tools and artifacts. We regard emotions as having an essential bodily component, to which investigators should pay attention, besides looking into their participants' thinking.

Understanding various aspects of current design practices might provide valuable information for the development of resources to support design work. We conceive such work as involving the whole person, mind and body, integrally, acting in a material- and social-world context. Further, deeper knowledge of design practices is essential for design education; especially, educators need to learn how to capture and support students' design processes in their projects; an area that has been identified as underdeveloped within higher education (Pedgley, 2007).

In the following, we first briefly explicate the role of embodied thinking and how it is related to craft and design processes. Secondly, since our investigation has methodological aims, we briefly review diary and event sampling methods of studying design practices. Thirdly, we describe two case studies conducted using CASS query that analyzed the socio-emotional experiences (i.e., challenges – competence) involved in the process of designing and handling materials during the creative projects. The purpose of these exploratory case studies is also to examine the feasibility of using CASS query to study design activities. Further, we discuss the limitations of the method, how the CASS instrument

could be improved beyond the version in the present study and what kinds of research issues are suited to the proposed methods.

Embodiment, Emotions and Materiality

Traditionally the body and mind have been studied separately. In recent years, the embodied dimension in designers' and artisans' work, has started to gain increasing attention (Mäkelä & Nimkulrat, 2011; Nimkulrat, 2012). Although the theoretical and conceptual work on these issues is sophisticated, there is still little empirical research applying the work to documented design practices, where concrete dimensions of embodied knowing apparently play a crucial role. The creative process is, in itself, a multi-modal process in which conceptual, emotional, practical, and materially embodied activities cross-fertilize and support one another. Concepts such as *tacit knowledge* (Polanyi, 1969), *knowing-in-action*, and *reflection-in-action* (Schön, 1983) are attempts to characterize the knowing and practices of skilled performers in art, craft and design. Expert practitioners have handled material countless times, and are thus able, without conscious effort, to imagine and predict the perceptual consequences of their actions. Thus, embodied thinking is seen as an anchor linking the mind and body; the emphasis is on understanding the relationship of the body in the process of thinking, i.e., how artisans relate their bodies, tools, materials, and space in their work setting (Patel, 2008). Further, in the context of craft education, there are recent attempts to analyze embodied thinking in the craft learning and teaching (e.g., Ekström, 2012; Illum, 2006; Johansson & Illum, 2012). These craft practices have been studied, for example, by examining in detail what happens in the craft classroom, with special emphasis on material and embodied aspects of craft activities (e.g., Ekström, 2012; Illum, 2006; Johansson & Illum, 2012).

Craft, and design activities are fundamentally creative in nature, requiring implementation of conceptual ideas in the design of materially embodied artifacts (Keller & Keller, 1999). Design practices consist of variety of different kinds of activities; for example, seeking inspiration and information; exploring and experimenting with materials and conducting manual craft work. Success in the craft or design fields depends on the mastery of the whole design and craft process, from generation of ideas to mastery of techniques and production of visual and material artifacts. The technique of sketching is an integral part of design activities, and drawing is generally the most important thinking tool for the designer (Goel, 1995; Seitamaa-Hakkarainen & Hakkarainen, 2000; Al-Doy & Evans, 2011). Visualizations and sketches are used to plan the work, but they are revised during the process, by the choice of materials and tools related to the specific context (Mäkelä & Nimkulrat, 2011; Mäkelä & Latva-Somppi, 2011; Kosonen & Mäkelä, 2012). This involves parallel working through conceptual reflection and material experimentation and implementation (Ramduny-Ellis, Dix, Evans, Hare & Gill, 2010). Although the role of visualization has been studied intensively, the role of material exploration and experimentation has not received much attention.

Mäkelä (2007; Mäkelä & Nimkulrat, 2011) has argued that both the meaning of making and its products (i.e., artifacts) are an essential part of practice-led research. Applying Schön's ideas about reflection-in-action and Cross's "Designerly way of thinking/knowing", he has pointed out that, in design process, designers evidently encounter situations where they have to take a different course of action from the one they originally planned. In order to understand her own design thinking, the designer needs to analytically reflect on her own thinking processes, actions and feelings during her own design process. Many artist-researchers or practice-led researchers (e.g., Mäkelä & Nimkulrat, 2011) have emphasized that, characteristic of practice-led research, is that it is highly personal, being centered on the creative practices of the self. This personal linkage also means that emotions related to the design processes are an important focus of practice-led research.

Diary method and event sampling

The design research paradigm is changing, and so are the research methods within it (Dorst, 2008). There is intensive research on creativity, design thinking, and design processes, and this research has shown significant progress with a particular set of theoretical approaches, methods, and techniques (Cross, 2006). Currently, researchers in the field of design have shown much interest in developing frameworks for investigating art, craft, and design as multi-level phenomena that, beyond individuals, take place in a certain material and social context. The thinking-aloud method and stimulated recall interview have been an established way of investigating designers' thinking processes (e.g., Akin, 1986; Goel, 1995; Seitamaa-Hakkarainen & Hakkarainen, 2001; Visser, 2006). The use of ethnographic methods studying design practices, especially in design organizations and teamwork, has become more prevalent (Ball & Ormerod, 2000; Keller, Pasman, & Stappers, 2006; Petre Sharp, & Johnson, 2006; Ewenstein & Whyte, 2009). The ethnographic method is most often used to identify design activities, design context, and organizational practices. Such research often involves direct observation of people, documenting, and recording their activities by the researchers. Further, the practice-led research has strongly contributed to methodological development of design research, as artists and designers have started to study their own creative processes (Mäkelä 2003; Nimkulrat, 2009). One of the key objectives of practice-led research has been to understand how designers, artists or artisans develop, over the long-term, new artifacts and ways of working.

A diary method (Bolger, Davis, & Rafaeli, 2003) is used in many design studies; the participants keep a working diary, where they document the whole creative process including written notes, sketches and other visual data (e.g., Jonson, 2005; Pedgley, 2007; Sjöberg, 2009). The diary method as well as sketchbook or process portfolios are used both to study others' and one's own design activities (Johansson, 2011; Sjöberg, 2009) as well as for evaluation of artistic processes (Lindström, 2005). For example, to study designers' tool usage in the conceptual design phase, Jonson (2005) developed a self-report diary, which consisted of a grid of numbered squares on paper, where each square represented half-a-day of ideation activity. Thus, each numbered square represents a time- and event-based coding unit for four categories of conceptual tools: sketching, words, modeling, and computing. The participants were asked to circle with a pen the symbol(s) for the tool(s) used in each session of the conceptual phase. Further, he interviewed the participants.

Practice-led design research has emphasized autobiographical or autoethnographic research, relying on a diary method (Pedgley, 2007). In order to understand his own design thinking, a designer needs to analytically reflect on his own thinking processes, actions and feelings during the personal design process. Anchored in the idea of reflective thinking, Pedgley (2007) carried out a detailed practice-led study of his own design project, based on systematic diaries (see also Bolger, et.al, 2003). He experimented with concurrent diary-keeping for the first 24 days, but came to consider it too disruptive. In the rest of the project, he conducted only the end-of-day retrospective, diary work. The diary entries included text and annotated sketches. Similarly, for example, Mäkelä and Nimkulrat (2011) have used their own working diaries and other documents – various visual and textual materials – to reveal the details of their own artistic design project. With their diary method, it was possible to collect various kinds of reflective data about one's own design decisions and related feelings. To document the overall creative process, they also used video clips and photos taken in various phases of the project.

As stated earlier, event sampling methods consist of repeated collection of real-time data on participants' specific momentary states in a natural context (Stone, Shiffman, Atienza, & Nebeling, 2007). These methods have been identified either with the Experience Sampling Method (ESM) (Csikszentmihalyi & Larson, 1987; see also Hulkko, Mattelmäki, Virtanen & Keinonen, 2004 for mobile probes) or the Ecological Momentary Assessment (EMA) method (Shiffman, 2000). ESM has focused on the sampling of experience at random intervals so as to capture flow experiences that occur

in situations of encountering challenges and feeling competent to do so. Methods of EMA, in turn, broaden the scope of event sampling from subjective experiences to associated external events (Shiffman, 2000; Stone & Shiffman, 2002; Stone et al., 2007). An event sampling method usually relies on one (or more) of four sampling strategies, i.e., signal-contingent, interval-contingent, event-contingent, and context-contingent sampling (Reis & Gable, 2000; Bolger et al., 2003; Connor, Feldman, Barrett, Tugade, & Tennen, 2007). The event sampling methods have been used in a broad range of health-related issues and therefore need to be customized specifically to the design field. Event sampling methods require pre-determined arrangements, i.e., an instrument for sampling experience as well as specific queries tailored to the objects of investigation – by which we mean, a set of questions, instructions, and training regarding how to report events. The collection of real-time data might provide unique data about experiences, emotions or social activities reported by multiple participants at specified time intervals, depending on the focus of the study. The length of data collection varies from day to months depending on the study.

In order to illuminate event sampling as a potentially fruitful method for design research, we will report on two case studies conducted using CASS query in which we analyzed both the socio-emotional experiences and handling materials during the design process. In the following section, we first detail the technology of CASS and our developed query. Secondly, we briefly describe the main features of the two case studies. Finally, we discuss related methodological insights.

Methodological experimenting: Two ways to use Event Sampling Method

Event Sampling Method as a part of CASS system

We have conducted experiments and case studies that used a smart phone as a data collection device. The first experiment was called “Capturing real-time design practices” and other was “Handmade Berlin”; both used the Contextual Activity Sampling System (CASS), as do the present studies. These studies also use the Experience Sampling Method (ESM) (Hektner et al., 2007; Shiffman, 2000) and event-contingent sampling. The CASS system was implemented on 3G mobile devices (e.g., Nokia E70, which has a full keyboard) with Symbian operating system, MP3, video, GPS, wlan (Muukkonen et al., 2008). The CASS-query tool is a Java-application for collecting process- and context-sensitive data on events, experiences, emotions of multiple or single participants at specified time intervals during the design process. Research and development of CASS is funded by the Knowledge-Practices Laboratory (www.KP-Lab.org) project.

The purpose of the CASS query is to have designers or students document their designing process by activating the mobile-device forming response to CASS queries and taking photos of their ongoing work. In addition, they are able to make audio notes during their creative process. The CASS query can easily be tailored to the specific purposes of the study, and it allows us to generate various sets of questions with different kinds of response formats, such as Likert scale, open text or multiple choices. The participants respond individually to the activated questions by writing a text, taking photos or making audio notes. CASS sends the data directly to the database, recording date and time of sampling. CASS inquiry can also be used to support the self-documentation process. By collecting real-time data of participants’ actions, it is possible to examine various factors, such as challenges encountered and experienced competence. The advantage of CASS query is that it allows one to acquire repeated measurements of single or multiple participants in the same time period.

The CASS interface is generic, so it can be applied to all kinds of activities and contexts, but the set of questions must be modified toward specific research interests. In the query, once it is activated, the questions follow in order established by the researchers when they designed it. Participants see one pair of questions at a time in the mobile phone screen and they are able to scroll up and down on the list of questions (see Figure 1). There is also a possibility to skip irrelevant questions.



Figure 1. CASS query implemented in 3G mobile device. (Screen shows two questions: Did you finish your task (yes, no, almost)? and How creative do you feel yourself in the moment? Scale 1–5).

The query for mapping out the design work

The query of the both case studies was designed following the feedback from a previously executed survey about knowledge work practices (Vartiainen, Hakonen, Koivisto, Mannonen, Nieminen, Ruohomäki, & Vartola, 2007). In the present case studies, participants answered a CASS query concerning their ongoing design projects, design context, emotions, and personal social networks. The query items were categorized according to four spaces: 1) *physical space*, 2) *tool and material space*, 3) *social space*, and 4) *mental space* (compare Nonaka, Konno, & Toyama, 2001; Vartiainen et al., 2007). These spaces served as a framework for the researchers to structure our query questions; it was not provided to the participants. The physical space as well as tool and material space relate to the context, the instruments and materials with which the designer was involved during the event. The social space relates to personal social networks and partnerships the designers were dealing with. Mental space and work orientation refers to the designers' emotions and experienced competence related to their work. Thus in these case studies, Csikszentmihalyi's (1997) four- mental-state model (i.e., apathy, relaxation, anxiety, flow) was applied to study emotions and flow experiences during the design processes.

The query consisted about 20 questions: 1) what, where, how and why questions, 2) Likert type structured questions, which called for ratings according to a five- to seven-step scale as well as 3) instructions for taking photos. There was slight variation in questions in both case studies. Three questions of the query related to the context or physical space, i.e., the place they were working. Participants were asked to take a photo of their working place in that moment, to answer why they were there, and to evaluate how well the place supported their work. Five questions were related to tools and instruments as well as material the participants were working with (i.e., tool and material

space). They were asked to photograph the tools and equipment they used and requested to describe how well the tools and material supported their work. Three questions enquired about the collaboration designers had, with whom they were interacting and how it supported their work about (i.e., social space). For the mental space we utilized Jackson and Marsh's (1996) 'Flow state scale'. We were interested in the various kinds of emotional states the participants may have had during their work; for example, how creative they felt at the moment or how well they were able to concentrate at that point and how challenging the situation was. Also the query items enquired about feelings related to stress, enjoyment and anxiety. Finally, four questions were related to the designers' work orientation. These questions concerned accomplishing the task, overlapping and routine tasks and related challenges of the task. The entire query was designed to be completed in 5–10 minutes.

After piloting the CASS query in our own research group, professional designers representing various design fields were involved in the first case study, Capturing real-time design practices; the professional designers used CASS query for 5 days. Each of the designers also provided short audio diaries that supported our data collection. The second case study, entitled Handmade in Berlin, was a slightly modified experiment in using CASS, and it was supported with a diary method. In both cases, CASS provided temporal data, that is, data about distribution or fluctuation of various aspects of designing across time. In the following, we will describe what kind of data our case studies provided. There were, however, certain limitations related to our data collection method using CASS, and we will reflect on these in the end of the article.

Capturing real-time design practices – case study

In the first case study, we were interested in the main aspects of individual designers' work; resources they used, the social dimension as well as the emotional side of their work experiences. Since we were experimenting and developing the CASS-method, we wanted to study professional designers in various design fields (i.e., a multiple case study design, as described by Yin 2003, Brewer & Hunter 2006; see also Jonson, 2005). We asked 6 designers who had worked as professionals for at least two years, to participate. Two fashion designers (A, B), two interior designers (C, D), one textile designer (E) and one carpenter (F, who specialized in designing acoustic interior walls) participated in the study. All of them were 'entrepreneur-designers', defined as freelance designers or designers who have their own small design enterprise. The participants were mainly working alone; they had their own permanent partnerships or networks working with, for example, manufacturers, customers and fabric bulk salesmen. During the data collection, they had their own design cases. For example, Fashion Designer A was in the ideation phase of a children's collection, and, in addition, she was designing a women's collection in its manufacturing phase. Fashion Designer B was designing prints to sportswear collection prototypes. Textile Designer E was making old pattern-ideas into new ones to be shown and sold to manufacturers in Sweden, and she was arranging meetings with manufacturers. Interior Designer C was starting a new design case with a new customer, whereas Designer D was engaged in the ideation phase of interior designing and had some design team meetings. Carpenter F was making trade-related brochures and processing texts in order to make a portfolio for the international exhibition in Köln.

All of the participants were asked to answer the questionnaire (which we have also called the 'query') several times during a day, and in addition, in the end of each day, to record a separate, spoken, diary entry in the phone. Designers were requested to report the main design events (i.e., what they have been doing) and to respond to the CASS query (i.e., set of questions) before moving to a next design event. They were given some examples of when to activate the query. This could be done, for example, when moving from one design work situation to another--such as from sketching to reading e-mails--when changing place or after being interaction with someone. The case study took place during the five working days, the duration of the whole study being one week. During the study, the mobile-based query CASS sent the data directly to the database, recording the date and time of the

arriving data. Further, all the end-of-day audio notes that were recorded in the phone were transcribed word for word. Those diary recordings were usually from a half minute to a few minutes long. There was one-minute limitation concerning each audio recording by the mobile device, although one could make a series of recordings, one after another.

Of six participants, three completed the query for five days, and three designers missed one day. Only four entries were incomplete due to the technical problems related to the server, and those data were excluded from the analysis. Altogether, designers completed 67 queries. Designer A and B were the most active in providing the CASS data whereas designer C provided CASS query only once a day. Designer C said later that she forgot to take the phone with her to the work place or forgot to activate the query. Five of the designers provided end-of-the-day audio recordings for each day. Designers filled out the questionnaire, for instance, after writing e-mails, after sketching, after packing products, when visiting fabric wholesalers, when negotiating with manufacturers and after paperwork.

As an example of the CASS data gathered in our experiment, we present a line chart of events related to experiences by Designer B and illustrate her emotions related to her working with print and embroidery designs. Figure 2 depicts Designer B’s reported events (date and time) related to her experience of the challenge of work, enjoyment and creativity. The query revealed that Designer B appeared to work with a quite challenging task from Tuesday (1.7) to Thursday (3.7), and she was greatly enjoying her work (scale values 4 to 5; 5 representing the highest value) for most of the time. She reported in her audio diary that she experienced a great deal of inconvenience at work because she couldn’t work at her studio because of a malfunction of the Internet connection. She felt that it made her work unorganized. However, according the query entries, she felt herself moderately or quite creative during the week (Tuesday to Thursday).

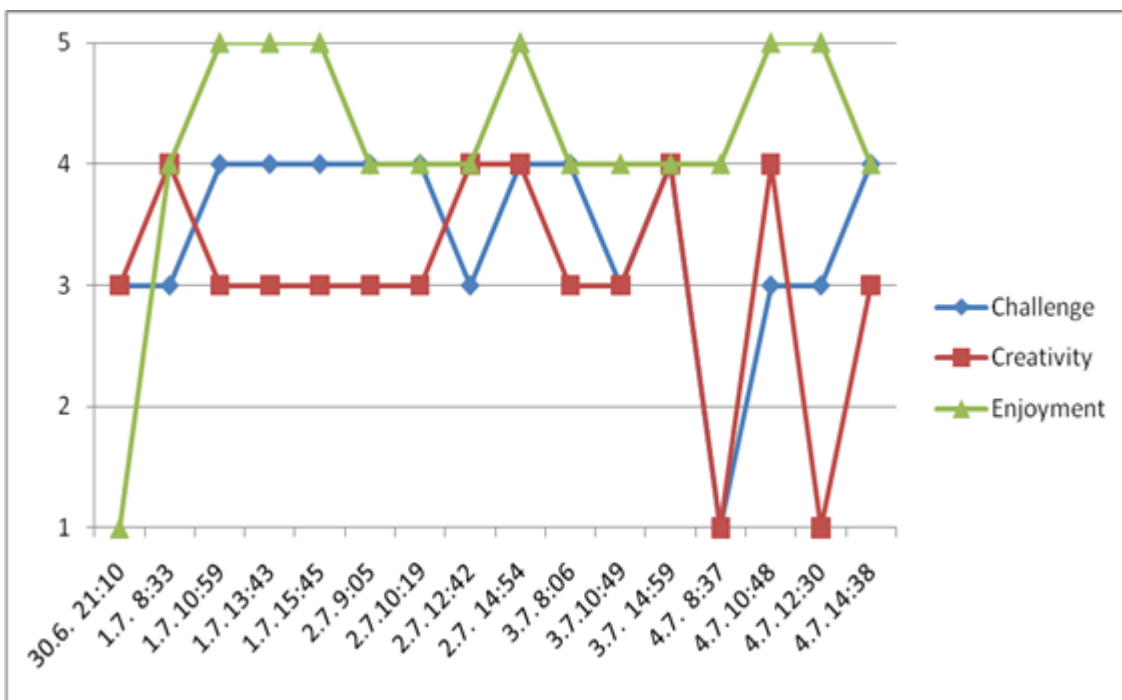


Figure 2. Designer B’s reported CASS query events (date and time) related to her experience of the challenge of work, enjoyment and creativity.

In the middle of the week, she took care of the business-related matters (i.e., insurance and retirement allowance) in addition to print designing. Also, during Wednesday, she was looking for new manufacturers and was in touch with them by e-mail. She got the prints ready on Thursday, and in the

diary she reported being happy about that. On Friday (4.7) she was organizing her papers and moving her archives, and the line chart shows that she did not feel creative. However, the line chart reveals that she still enjoyed very much of her working day. In the following excerpt from the audio diary, she complemented the Thursday CASS-query entries in her own words:

Today has been one of those days, I've been putting the finishing touches on the fleece jackets and the last of the weight patterns which earlier didn't seem to work but now, they're all done, so the winter 2010 collection printing and embroidery is all done. This puts me in a good mood as the client is just leaving for a vacation, Hopefully after this week we'll have everything up to speed. On the other hand, it's very difficult to work from home, because there is so much here that I would rather be doing than work, hopefully they will fix the Internet at the office soon. What else...I feel very tired recently, but it's good in a way, with all the changes coming and how I've made progress with some people who are hard to deal with. On the other hand, because I'm only in the initial phase of this business, I've been able to work on some business things. (DB; Audio diary 3.7.2008)

As a part of the query, the participants were asked to assess in the context of each design event, the support for their process provided, respectively, by the design tools and the design related materials. The designers reported a diversity of design tools that they used during their working. As expected, most of the designers used sketching tools, either design software or paper and pen. In addition, all of them also used information-managing tools and communication tools. Computer-aided drafting was reported in the data, but it was merely used for editing and altering sketches. They mainly considered that the design tools supported their work process very well. Designer B used materials for sketching and designing (i.e., color and material maps) as well as for experimenting, for example, when producing preliminary plans, sketches, and prints. As stated earlier, Designer B worked with the prototypes of her sportswear collection, so she used paper prints and visualizations of embroidery for executing prototypes from Tuesday to Thursday and archiving papers in the final day. As an example, we constructed a line chart based on the Designer B's CASS query. Figure 3 shows her estimate of the degree to which each of the resources that she was using, supported her work during the week.

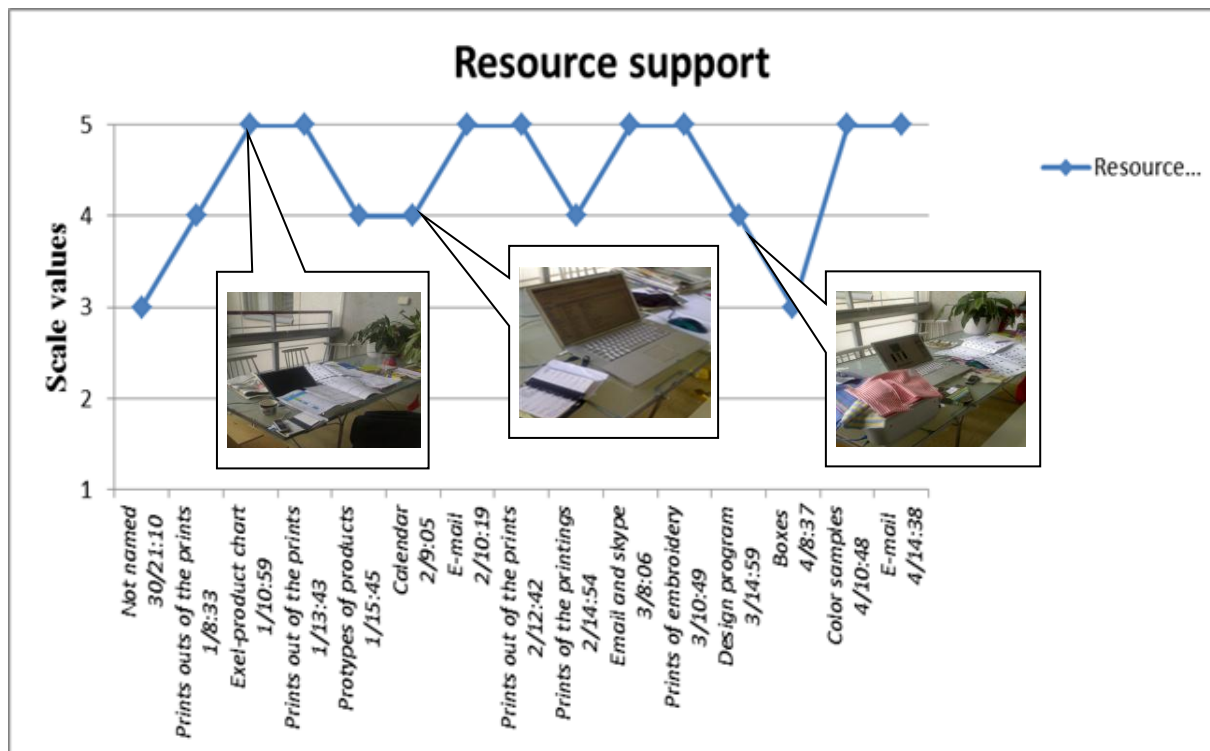


Figure 3. Designer B's reported CASS query events related to resource support.

The CASS query revealed the multi-layered nature of the design work, which was related to the physical and social spaces of working. The designers reported a variety of physical places (such as home and studios) as well as virtual and social spaces (Skype, Net meeting, meeting customer or colleagues in face-to-face) where they worked. In her end-of-day diary entry Designer B concluded briefly, on the day's run:

Did four printouts, the embroidery is almost finished and did some company business and had a teleconference through Skype.(DB; diary 2.7.08)

Handmade in Berlin – a street art project

The purpose of the second case study was to examine, longitudinally, one textile artist's 'street art project' in Berlin. Handmade in Berlin is an example of the autoethnographical research that used CASS query to document one's own creative practice. In this case, the artist was a master's degree student and the project, part of her master's thesis. Because one of the authors of the present paper acted as a supervisor of the work, the student was willing to document her working carefully. The aim of the study was to analyze how she experienced her project and reveal the emotions related to creative aspects of the project. Especially we were interested in flow experiences and the critical incidents that occurred during the project.

The aim of the Handmade in Berlin project was to search for new ways of utilizing textile art as a part of the street arts. Knitted graphics have become very popular in recent times, but instead of doing the usual knitted graphics, she had the idea of finding new means for producing street art by various textile methods. The design project can be seen as an experiment: It consisted of series of art works that composed a thematic whole. The traditional textile techniques were used; knitting, sewing, crocheting and lace-making. The finished textile works and places can be found in the blog <http://handmadejemi.tumblr.com>. The design and making process of the street art project took 23 days. She activated the CASS query in the mobile phone 66 times during the project, varying from 3 to 6 times a day. She also wrote beginning-of-day and end-of-day diary entries every day.

In this case, CASS allowed us to assess participant's flow experiences. According to Csikszentmihalyi (1997) people experience flow when they are functioning at the edge of their competence, when they are facing a challenging task and their experienced skills are adequate for dealing with the task. Anxiety rather than flow is experienced when people do not have - or feel that they do not have - adequate skills for solving problems encountered in their work. According to investigations of Csikszentmihalyi (1996), people usually experience more flow and learning in their work than during their leisure time. This textile artist was especially interested in the fluctuation of her experiences of engagement and flow. We based our enquiry on Csikszentmihalyi's model of four mental states: apathy, relaxation, anxiety and flow. Based on this account, we analyzed optimal experience related to adequate competence for dealing with a challenging task. Figure 4 provides data of her experienced emotional state in relation to her own average feeling during the street art project. Inkinen (2008) developed a mathematical model to count experienced flow state, and the present graph is calculated based on this mathematical model.

The data show how designing involved rapid movements between positive and negative emotions, such as excitement and anxiety. Figure 4 shows computed sum variables of negative feelings (in red) and positive feelings (in blue) and four mental states (in green dots). Level 4 (scale at right) represents moments of being in optimal, flow state; level 3, anxiety (big challenges, low competence); level 2, relaxing (big competence, low challenge); and level 1, apathy (low challenge and low competence). Together with diary notes, she was able to connect critical incidents, place, time and

tools and emotions of her craft work. In the following, we provide some excerpts about emotions based on the analysis of the written diary notes.

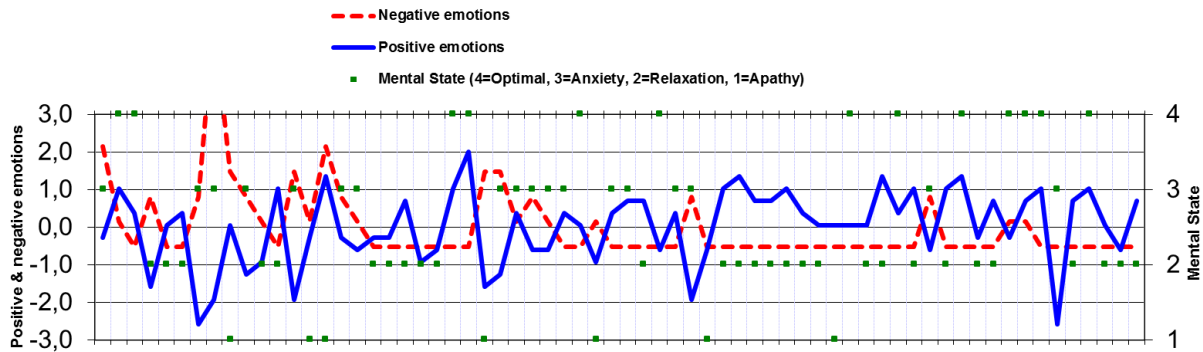


Figure 4. Textile artist's negative (in red) and positive feelings (in blue) and four mental states (in green dots).

Productive creativity is not just being in flow but requires successful working through temporary obstacles and frustrations. Figure 4 reveals that, during the project, she felt mainly relaxed ($f=27$); also, from time to time, anxious ($f=17$). She felt apathy seven times, but more often she experienced a flow ($f=13$) state. The flow state was connected strongly with the making phase: working advanced smoothly and materials supported the intended work process. The working proceeded as planned and the goal was clear. She also felt competent; the challenges and her skills were in the balance. Usually the flow state was recorded somewhere in the middle of the day, when work had already started. By contrast, anxiety was present when the goal was not clear; work was hard and did not proceed as planned. Also, this feeling was present when there were not the right kinds of materials or tools available, or when she needed to search better materials or tools. Usually before starting to work, she was anxious, because the plan was not clear enough in her mind. However, when work advanced, the mental state also changed.

Somehow it just felt like my motivation for the whole idea just waned, because the task was so hard and results didn't seem to come about. Particularly when you want your work to look cool.

Figure 4 also shows that in the main part of the project, she felt relaxed. Relaxation was present when there were not big challenges and she was able to fully concentrate. This was also connected to familiar techniques and her possession of the needed skills to complete the work.

Making was enjoyable and went well. There were no real problems along the way and it was easy to handle the materials.

In general, we can conclude that positive feelings, relaxation and flow experience were more common toward end of the project. She was able to systematically follow her own design process and understand the dynamics of her design work (Viitala, 2011).

The project was completed in one fell swoop. The sewing was completed quickly, compared to last week's work. It's probably because I had more time to think about the designs and only really had to design small details of it and just make them.

Conclusion

The purpose of our research was to explore the feasibility of collecting research data using mobile technology—in this case CASS query—and apply an event sampling method in the context of design work. While exploratory in nature, our study was a first step towards capturing the complex field of design work. It is essential to develop new methodologies for capturing the multi-faceted nature of designing, materiality and mediating artifacts. The data collection method of CASS provided one possibility to capture, at least partially, some features of designers' work and related emotional experiences. However, it is apparent that the full potential of CASS method as a data collection tool had yet to be realized. In the following, we will critically discuss advantages and disadvantages of the event sampling method and CASS query, in particular, as a research instrument.

Depending on the scope and intensity of the data collection method, the CASS query is suitable for longitudinal design projects conducted by committed designers. Together with the diary method, it is possible to collect various kinds of emotional data as well as video clips and photos of the different project phases. This is considered useful in design contexts because the situations can change rapidly; also the need for different kinds of notes may arise. In addition, the portability of the device is an advantage; it can be taken wherever the designing happens (see e.g., Pedgley, 2007).

However, answering the query interrupts the user's activity, requiring her to stop and answer questions. This became evident in the first experiment: Some participants failed to actively report their design activities. It appeared that participants had difficulties in providing as many queries (three to four) as they had design activities. Such sampling bias may be systematic (not reporting in more demanding situations such as multiple tasks in the same time) and affect the results of investigation. These gaps became apparent because two research instruments, i.e., CASS query and the end-of-day diary, complemented each other in such a way as to allow us to compare the relevance and authenticity of CASS query alongside descriptions of the daily workflow from the end-of-day diaries and vice versa. In the second experiment, CASS data were richer, and there were no similar lapses because the aim of the study was more focused and the designer was motivated to analyze her own designing. The problem of interruptions could be dealt with in the future; there is the possibility to add a not-so-invasive vibrating signal to the mobile phones, which would alert the designers to answer; yet the use of signaling is not a perfect solution. In the near future, it will be also possible to install the query software in designers' own mobile phones. In this way, the query would actually come closer to designers' daily practices, and their responding to the query would perhaps come more naturally.

We are envisioning that CASS query might be applied to the participatory design or self-documentation in user studies, where a project's designers propose to understand people's feelings, pleasure and values related to future design products. In this sense, we are proposing that CASS query could be applied as a design probe. For example, Hulkko et. al. (2004) found mobile probes useful in investigations intended to explain social behavior connected with shopping. They also envisioned possibilities in probing users in the case of developing new practices and social innovations. In these kinds of participatory design workshops, the intended users can employ CASS query to write down what they are doing and how they feel based on the given questions or claims; they can document the context of the product by taking photos or video clips (see also Mattelmäki 2006). Studying the affective dimensions of user-centered design studies may open up an intriguing field of inquiry. Future

research may examine self-reports of affect both before and after the use of the design product, since such measures may allow investigation of how various user contexts are experienced.

Our next CASS study will be related to our Handling Mind research project, where the purpose of the research is to analyze design thinking and its material embodiment in studio-based practices. One experiment will follow the autoethnography method in practice-led design. The other will concentrate on the collaborative design process. Both investigations will combine video recordings, CASS query and stimulated recall interviews. The students will document their designing and answer CASS queries during the design session. Also they will use working diaries during the whole process. Further, stimulated-recall (SR) interviews will be conducted at the end of the design session. All the produced sketches, experiments and prototypes will be collected. Although the full potential of the use of CASS is unknown and the feasibility is still under investigation, it is being developed to meet the methodological challenges which have come to light.

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