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## **Promoting design probes in interior design and in the user-centred analysis of a space in the context of Finnish higher education**

### **Abstract**

Probing is a new, playful co-design method that enables future users to participate in a design process in variant design contexts. This article is based on a case study of applying and developing the probing method as a part of studies of interior design in higher education in craft and design. The article reports probing processes of the university-level students ( $N=72$ ), training to become textile teachers, and their reflections on the method. The data on the case were collected during two interior design courses held in a single institution in 2014 and 2015. The results outline the students' processes from the point of view of participation, spaces chosen as well as their reflections. After the students experienced the probing process, they suggested ideas for its application in teaching design in different educational degrees as well as applications in other contexts.

**Keywords:** interior design, craft, design education, user-centred design, probing as a method, design probes

## Introduction

From the point of view of design students, the thoughtful design and inclusion of creative learning activities in design education is crucial in helping students release their creative potential (Lau et al. 2009). It is also proposed that design educators should do more to research and document how they teach design (Orthell 2015). In the present study, I promote the development of these with the use of the probing method in interior design studies with Finnish university-level students ( $N=72$ ), training to become textile teachers.

Although the word *probe* may take our thoughts into space, the depths of the oceans or other kind of places not accessible to researchers, the concept *probing* is in the present study based on the exploitation of self-documentation and other methods of user-centred design. As an approach of user-centred design, probes are to understand human phenomena and explore design opportunities (Mattelmäki 2006). They are based on user participation and self-documentation (diaries, photography, collage and so on), emphasize the user's personal context and are often visually rich. The nature of the probing process can focus on two premises: on inspiring the design process or on gathering information (Gaver et al. 1999; Mattelmäki 2006; Keinonen et al. 2008). The benefit of probing is that, information can be gleaned over long periods of time from situations and environments that are normally inaccessible (Keinonen et al. 2008: 3; Pedell et al. 2014: 6). Budd (2011) criticizes the current interior design education for moving away from intuitive elements, like feelings and emotions in a learning process, as well as forgetting crafting of an experience for the user. According to him, to be able to design well, students' abilities like rational thinking, understanding of the business principles, identify problems and show quantifiable benefits cannot be emphasized over having a passion for design as foundation elements facilitating collaboration. From the point of view of the students probing processes, the focus in this study is on obtaining

users' knowledge of the daily environment. Furthermore, inspiration and the combining of intuitive processes, such as feelings and emotions in a learning process, are equally important.

Finnish craft education nowadays largely highlights a holistic craft process, in which all phases of the design process (ideation, making and evaluating) are carried out by the same person (FNBE 2004, 2014; Pöllänen 2009; Kangas 2014). Pöllänen (2009) has contextualized Finnish craft education with using four pedagogical models. *Craft as product-making* emphasizes the product made by one's own hand by obeying ready-made models and instructions. Here the teaching follows the lines of the so-called ordinary craft (see Kojonkoski-Rännäli 2008), a reproductive craft without the maker affecting the designing phase. In *craft as skill and knowledge building* the design and refinement are based in knowledge building, but are supported by linking the skill acquisition to technique, materials and tradition. *Craft as self-expression* is based on holistic craft and means one's expression of skills, knowledge, thoughts and experiences through a craft process. When craft is regarded as *design and problem-solving*, it is motivated by real-world problems and the making of an artefact ~~bounded also providing~~ provides a meaningful context and experience into a learning process.

The context of *design* is considered as an essential aspect also in the national curriculum for craft education (FNBE 2004, 2014; Kangas 2014). In Gardner's study of craft education and its future in Finland, the interviewees (craft teachers, craft teacher preparers and educational administrators) often mentioned the purpose of 'learning good design' as one aim of learning craft as well (2002: 137). In a context of design, craft education is seen as design-based learning related to the solving of authentic problems – for example, in our daily lives – and shaping of environments (Pöllänen 2009; Seitamaa-Hakkarainen 2010; Kangas et al. 2013). However, at the same time, variant educational contexts of craft need stronger invest in holistic design methods and ideation (Gardner

2002; Pöllänen 2009). According to Pöllänen (2009), for example, such of ideation phase can be built-up through sensory experiences, like music, smells and scents as well as with the help of visual or written material, memories, field trips and visits. Also for textile teacher students, it has seen important to gain more experience with various tools and mediums of design ideation as well as collaborative learning methods (Lahti et al. 2016: 36). The study at hand promotes the probe method as an example of the strengthening and enriching of design ideation and activities in the context of craft education. The research objective was to investigate students' probing processes from the point of view of spaces and participants chosen as well as probing processes carried out. Also the students' experiences and ideas of developing and using the method in the future were examined.

The study is a case study with a focus on holistic description and explanation of a bounded system (Merriam 2009; Yin 2014). In the following, I will first introduce the probing method and its user-centred theoretic background. Then the process of probing is described from the point of view of the students, and the methodology of the study is clarified. The results outline the students' processes from the point of view of participation, spaces chosen as well as their reflections.

### **Applying user-centred design and design probes in research on environments**

User-centred design, also known as human-centred design, customer-centric design and usability engineering, is a multidisciplinary approach that relies on a user's involvement during the design and development process (Millet and Patterson 2012). User-centred design includes a wide range of methods from traditional consumer research to exploratory methods. In present practice, three approaches – observation, exploration with prototypes supporting designer and user collaborations –

are the most common (Keinonen et al. 2008). In Vischer's (2008) theory of the user-centred approach of a built environment, the user is central as an operator, an active agent and a consumer of the built environment. She criticizes the environmental determinism paradigm in which, according to her, human behaviour is influenced by the features of the spaces people occupy. Much more stress should be put on analysing how people act in their environment and how this behaviour redefines the user-building relationship (Vischer 2008). Probes are among the new challenges in the field of design, where traditional design methods ignore the becoming user (Mattelmäki 2006; Madden et al. 2014; Sanders and Stappers 2014). Using the probing method as a user-centred analysis of chosen space in this study promotes the student to analyse the degree of functional comfort as well as the environmental barriers/stress in the users' environment. Based on Vischer's theory (2008), the user-centred approach here focuses not only on a better understanding of how behaviour is influenced by the environment but also on the users' activity in their environment and how such behaviour redefines the user-building relationship.

The roots of the design probes are in the cultural probes introduced by Gaver et al. in 1999 (Jacobson and Pirinen 2007; Madden et al. 2014). Cultural probes are a design-oriented way of gathering inspirational glimpses of communities targeted for design. The participants are usually at a distance and return the data over time. Cultural probes are usually used to inspire a design team with the data collected when designing new products (Forlizzi 2008). After the development of cultural probes, technology probes, empathy probes and value probes followed (Madden et al. 2014).

In this study, the probes were applied mainly in domestic interiors. Only in three cases ( $N=3$ ) the space probed was other than domestic. In the domestic context, probes usually emphasize the ethnographic and informative nature of probing (Hemmings et al. 2002; Mattelmäki 2006).

However, probing should not be or understood simply as a substitutes for the ethnographic research of the practices of everyday life (Boehner et al. 2007; Forlizzi 2008). Technology probes, for example, were applied in a domestic environment to examine how to maintain family communication between multi-generational family members living separately in three countries (Hutchinson et al. 2003; Madden et al. 2014) as well as in another study sought ‘to understand how grandparents and grandchildren can utilise social technology to interact more in everyday life in a fun and meaningful way’ (Pedell et al. 2014: 6). Design probes were also applied to find accessible solutions with disabled persons in their domestic environment (Jacobson and Pirinen 2007). The study found that disabled people are not a homogenous group with uniform needs regarding accessibility and that a person’s identity and lifestyle are not defined by his or her disability. There is a need to develop accessible design towards more individuality (Jacobson and Pirinen 2007).

## **Methods**

### ***Participants and setting***

Interior design is most commonly approached as a ‘professionally conducted practice-based process of the planning and realization of interior spaces and all the elements within’ (Edwards 2011: 1). As a part of craft studies in textile teacher education, however, interior design is not being educated from a point of view of students becoming professional interior designers, but to learn to teach designing to the pupils or adults. In spite of the degree and characteristics of professionalism in designing environments, creating a cosy, functional and personal interior, the designer must organize the tangible components of space, form and shape, line, texture, light and colour as well as have knowledge about the future users of the space (Nissen 1994).

The application of design probes at the present study was a part of a nine-week course called Research-Based Interior Design. The course was a compulsory, advanced-level course in interior design in a programme for Textile Teacher Education, at the University of Helsinki, Finland.

Design probes, characteristic of co-design practice, aim at enabling users to participate in user-centred processes (Mattelmäki 2006; Jacobson and Pirinen 2007; Mattelmäki 2008). Following this idea of design probes, the aim of the course was to learn to collaborate and apply design probes in analysis of the user experiences of a chosen space (domestic or other). The results of the probing process have value in themselves and can also be utilized in a later course concentrating on the design and making of interior textiles in a chosen space. The students were asked to define the purpose of each probing process in their probing reports.

The probing process is usually divided into five stages: (1) starting the process by creating a probe kit; (2) the probing phase; (3) the first interpretation of the returned probes; (4) a deepening phase where the probes lead to more detailed phrasing of a question; and, finally, (5) the interpretation and ideation phase in which the new design is formulated based on the probing process (Mattelmäki 2008; Madden et al. 2014). A probe kit contains self-documentation and self-reflection tasks that focus on the user's interest regarding the focus of the design project. The tasks can include, for example, diaries, photography or open questions to prompt responses and insights concerning the participant's everyday life. The probes are returned to the researchers after documentation (see also Keinonen et al. 2008). In this study, a probe kit could be, for example, a physical box containing probing tasks for the participants or a virtual one such as a closed Facebook group.

The first step for the students was to choose a space that they wanted to analyse with the probe method and to create a probe kit. The probing process and the analysis of the results as a whole had

to be finished during the nine-week course, as Table 1 illuminates. Because of this time limitation, I developed a suggestion for the structure of the contents of the probe kit. This probe kit consists of five parts:

1. *A scaling task of the space* (an analysis of the space, for example, the range of light/gloomy, peaceful/noisy, personal/impersonal)
2. *An analysis of the daily use of the space* (or an example analysis of the residence area the space and routes when using it)
3. *The colours and atmosphere of the space* (observations of the colours and materials of the space)
4. *Feelings and emotions evoked by the space* (observations of feelings of pleasure, stimuli, smells, etc., in the space)
5. *An interview of other users of the space* (views on functionality, lighting, first impressions, etc.)

The students could design a probe kit with different contents and emphasis as suggested if, for example, the nature of the probing was more focused, for example, on the artistic process than on gathering information.



week 1	week 2	week 3	week 4	week 5	week 6	week 7	weeks 8–9
Assigning of the probe task by the teacher	Choosing the space to be analysed	Designing the probe kit	Designing the probe kit	Using the probe kit in a chosen space	Using the probe kit in a chosen space	Using the probe kit in a chosen space	Analysing the results and writing a report

**Table 1:** The phases of the probing process from the point of view of the student.

### *Data and objectives of the study*

The research was undertaken in a single university-level institution as part of advanced-level studies of craft in interior design. The data were collected from two courses in spring 2014 and 2015 in which I was a teacher. The data consisted of students' probing reports ( $N=72$ ), questionnaires evaluating the method from the course of 2015 (see Table 3), as well as my observations and a reflections during the courses. Within the nine-week period of designing and completing a probing process (see Table 1), the students returned their probing reports as PDF files into the Moodle virtual learning environment. The probing reports are in five parts: (1) introduction (the purpose and aim of probing); (2) presentation of the space probed (with words and a 3D model of the space made in the course); (3) presentation of the probe kit made (with words and photographs); (4) results of probing; and (5) discussion. In the discussion, students were asked to make a short conclusion as well consider the method from the point of view of future applications – for example, in craft education.

The study is a case study, which is here understood as ‘an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-world context’ (Yin 2014: 16). As typical for a case study, the focus is on holistic description and explanation of a bounded system (Merriam 2009). By concentrating on a single phenomenon or entity, which in the present case is probing as a process of learning user-centered interior design, the aim is to uncover the interaction of significant factors characteristic of the phenomenon examined (Merriam 2009). In this study, the case study method is classified as a ‘holistic analysis’ (Creswell 2013: 75) of the case, which includes data from two courses on Research-Based Interior Design. The purpose is to describe the case as well as analyse the students’ reflections about the method in general and also from the point of view of future applications. An analysis of this enquiry is richly descriptive: there are description of the contexts, the participants involved and the activities of interest (Merriam 2009). In spite of the qualitative focus, some quantitative entities such as the number and differentiation of the spaces probed (Table 2) and classification of the types of participants are represented as well.

In qualitative research, the researchers build towards a theory from observations and intuitive understanding gleaned from being in the field. These observations or documents are combined and ordered into larger themes (Merriam 2009). In the analysis of the probing reports ( $N=72$ ), the contents of each report were first divided into sections: (1) the space probed; (2) the participants involved; (3) the type of a probe kit created (virtual or physical, for example, a box or a folder); (4) future applications of the method proposed; and (5) evaluations of the method proposed or other relevant content from the study. The last section contains notes and observations based on what emerges from the data and what I have learned as researcher and as a teacher (Boglan and Biklen 2007). The questionnaire was coded by reference to each of the four questions (see Table 3) Questions number one and two operates as questions giving information on the students’

background, whereas the following open-ended questions elaborate more on probing. The objectives of the study are as follows:

1. What spaces were chosen for probing, and who participated in the probing processes?
2. What kinds of probes were carried out?
3. How did the students experience the probing process, and how would they exploit the method in the future?

## **Results**

### *The participants, the spaces chosen and the probe kits made in the probing processes*

The students defined their own aims for the probing process based on their various life situations. These included, for example, a need for some kind of change in the student's room/space, a need to change a nursery into a teenager's room and a need to examine the functional properties of a room. In another situation, along with the probing process, the most important values of a dwelling were clarified. One student even stated that for her the most significant target of the probing was to 'find a better presentation for the many souvenirs in my home'.

<b>Space</b>	<b><i>N</i></b>
Bedsit	14
Living room	13
Nursery	8
Bedroom	8
Room in a student dormitory	4
Kitchen	4
Combined kitchen and living room	3
One-bedroom apartment	3
Hall	3
Public space	3
Bathroom	2
Balcony	2
Dressing room in sauna	2
Workroom	2
Room in a summer cottage	1
<b>Total</b>	<b>72</b>

**Table 2:** Number and types of spaces probed.

In most of the cases, a partner of the student ( $N=25$ ) was involved in the probing process or a partner and the children in the family ( $N=10$ ). Another major group of participants was friends, relatives and colleagues ( $N=22$ ). One participant even organized a dinner party at which the participants carried out the probe tasks. In six ( $N=6$ ) cases only the children of the family participated in the probing process. In some ( $N=2$ ) cases the children's friends were involved as well as roommates ( $N=4$ ) when living in a student dormitory. In three cases the space was other than domestic. These participants were the workers of a congregation who used a clubroom ( $N=1$ ), students who used the restroom of a student associations ( $N=1$ ) and the workers of a cooperative connected to an art and craft shop ( $N=1$ ).

As mentioned earlier, an example of a probe kit was given in advance because of the tight schedule. Most of the students followed this example with some variation in the tasks, for example, in the analysis of the space in daily use, which was carried out with route maps and tables. Most of the probe kits were physical objects: folders or boxes containing tasks such as writing diaries, taking photos, making collages or holding interviews. Four ( $N=4$ ) kits were virtual, such as a closed Facebook group for those involved in the probing. According to Mattelmäki (2006: 72), 'there is no ready-made pattern for designing a probe kit or tasks'. In examining people's experiences Sanders and William (2003) suggest make-tools such as pictures, collage templates, workbooks and stickers as being useful. The probing tasks made by the students included collages made of clippings from interior design magazines of the desired and undesired objects in a future 'dream interior'. Colourful note stickers were used to mark pleasant and unpleasant objects in the interiors. New floor plans on paper were made and concrete changes in interiors were done as a result of the probing process, and photographs of the new interiors were taken. In one probe kit, the activity in the living room of a family with kids was photographed from 8 a.m. to 8 p.m. Mattelmäki has emphasized the designerly spirit and artistic approach of the probes to be important in user-centred

probing. The probes can ‘record views of the user’s aesthetic environment and its individual significance’ (Mattelmäki 2006: 63). This was implemented in a probe kit, in where a kind of Rorschach inkblot test was used to evaluate the atmosphere of a chosen space. In this task, eight respondents each choose from six inkblots the one that according to his or her opinion mostly illustrated the space. Respondents also described the connection between the space and the inkblot they chose. It was also pointed out by the students that it is useful to indicate that the probe kit is designed for the person who is going to use it. One student included photographs from the user’s childhood in the probe kit to make it more personalized. Supporting positive emotions in last-mentioned way is significant from the viewpoint of designing probes, because positive emotions promote respondents’ flexible thinking and problem solving in conducting probe tasks (Isen 2004; Mattelmäki 2006).

### ***The students’ experiences of the probing process: Generating the three dimensions***

In daily life, one does not necessarily consciously identify flaws in dwelling, such as noticing the inadequacy of storage space in the hall. The flaws are just an irritation that one becomes used to without imagining new solutions. The students found, that probing was a suitable method for a more objective observation of the space. In qualitative research, the researchers build towards a theory from observations and intuitive understandings gleaned from being in the field. Pieces of information such as interviews, observations or documents are combined and ordered into larger themes (Merriam 2009) or into case-based themes (Creswell 2007). From the basis of this study, three dimensions can be identified as central and strengthen the user-centered analysis and design of interiors when exploiting the probing method. I will next analyse students’ experiences of the

probing process and examine these dimensions of *creating a dialogue*, *conceptualizing* and *increasing the role of planning as a pre-design phase* as well.

Entire families participated ( $N=10$ ) in this study as well as children or single children ( $N=6$ ). One important observation was that in families with children, the child's voice about home interiors is not usually taken into account even if the question is about a nursery. It was found out that in the context of interior design, especially for domestic interiors, the probing method was useful in *creating a dialogue* between various user groups as well as between designers and non-designers (see also Mattelmäki 2006: 61; Madden et al. 2014). Probes also involved 'silent' user groups, such as men and children, who usually are not heard in (this feminine-dominant era of) interior design (see Havenhand 2004; Johansson and Saarikangas 2009; Edwards 2011). Despite that men who participated did not usually like any kind of 'tinkering tasks', they responded that they were pleased to have the opportunity to be heard and to participate in designing the home space. According to a one student, 'the best result of the probing process was that just for once the family stepped back to discuss dwelling preferences from the point of view of the child'. Also, another student emphasized this in her probing report:

In my probing process, the probing tasks themselves and involving kids in analysing the home interior were even more important than the results of the probing. Surely every family with children has this daily discussion about where things belong after use and why it is not allowed to drink cocoa on the sofa as well as why we do not climb on the table. Still, how often we discuss with the child what kind of environment she/he wants to live in and what kind of solutions would make it easier, for example, to put things back in their own places?

It was, however, found that children need more functional probe tasks such as playing, drawing or making choices about concrete materials rather than discussing. On the other hand, children might be more responsive and open to new experiences than adults. It is important to find interesting tasks, especially with younger kids: a 3-year-old child is not able to evaluate where to place furniture in a floor plan, but he or she can sort out her or his favourite colours. In one probe kit, the children of the family even received diplomas after doing the probe kit tasks. An aspect of a probe kit as ‘a surprise box with many kind of exercises’ (Mattelmäki 2006: 73) was promoted in a probe kit that was themed and illustrated after a popular children’s television programme. The most important issue in the use of a probe kit, according to the students, was that the probe kit and the tasks included in it are designed carefully just for the target groups who will use it.

Together with the dimension of *dialogue creating*, applying probes in the interior design process enabled ‘writing the words’ and *conceptualizing* issues that are difficult to describe or are somehow unconscious, such as the sounds, unpleasant smells, too little storage or a work room left unused. This is congruent with a case study seeking opportunities and problems related to work of nurses in a hospital environment, in which the nurses reported that they became more conscious of their environment as a result of probing (Mattelmäki 2006). Another issue connected to the use of concepts, however, was that they are ambiguous. One part of the probe kit was a scaling task, in which the space is evaluated, for example, on a scale of bright/gloomy or personal/impersonal. In the probing processes, these concepts were understood quite differently by different participants; the dimension of organized/chaotic, for example, was problematic because what is organized for one person is not the same for another.

According to the students, probing was seen as an inspirational and encouraging method for the beginning of the design process and a method that clarifies thinking about the space. Applying



probes in the interior design process not only inspires but *increases the role of planning as a pre-design phase*, an area that needs to be strengthened in craft education (see Gardner 2002; Pöllänen 2009; Lahti et al. 2016). In the educational context, the probing approach was evaluated as improving the role of planning both with children and adults. In the education of craft in the school context, the method was seen valuable in teaching topics related to dwellings.

### ***The students' suggestions for future exploitation of the probing method***

In spring 2015, the students were asked with a separate questionnaire to evaluate the probing method as a part of collecting user-centred information about interiors, as well as to give concrete examples of potential future applications of the probing method in educational or other contexts (Table 3).

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#### **Content of the questionnaire**

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1. Were you acquainted with the probing method before the course? If so, please specify in what way?
  2. To whom were the probing tasks directed?
  3. In your view, how is the probing method appropriate in interior design?
  4. Based on your probing experience in the course, please give some concrete examples of educational or general cases to which the method would apply.
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**Table 3:** Content of the questionnaire given to students in 2015 after completing the course.

The students considered the usefulness of the probing method in a number of design situations and contexts. In the educational context, especially in secondary school, the method has been seen to be applicable to the subject matter of clothing and apparel – for example, at the beginning of a design process to clarify style preferences. Inspired by the method, one group of students carried out a didactic development project as a part of the pedagogical studies of textile teacher education in which the subject matter of clothing was under probed. The aim of the process was to examine personal preferences for clothing style and support a design process of one's favourite outfit as the first step of the design process ([https://prezi.com/5l\\_f4p9jasi2/tyyliluotain/](https://prezi.com/5l_f4p9jasi2/tyyliluotain/)). The method was seen useful in the design processes of home textiles to better take into account the space and the interior as a context of the design as well in teaching interior design in adult education centres. Topics related to consumption may also use the method, as, for example, one student had probed a wardrobe.

The probing method was experienced as being useful in increasing the functionality and cosiness of, for example, a domestic space. It offers a method for collecting information and experiences in the context of using the space as a part of everyday life. The method was seen as useful in situations in which there is a need to analyse the level of utilization of a certain space. This was the case with some domestic spaces, such as a fireplace connected to a sauna, which actually nowadays is used for storage. With probing, it is possible to consider whether the space would serve another purpose before starting a renovation, as well as to become more aware of the residents' preferences to find what needs to be changed or taken into account when moving to the next apartment. Three students mentioned probing as a possible method to co-design with elderly people in a retirement home, because those interiors are usually clinical and cold. Using probing in the co-design of the interiors of a kindergarten was also mentioned as well as found to be fruitful in the design of public or shared spaces in, for example, student dormitories and school spaces, shopping interiors or even parks.

The students evaluated that the probing method could be applied to examine relationships between workers in workplaces. It is possible to analyse who is in contact with each other, what kind of feelings are present between colleagues and whether there is a need for improving the in relationships in a workplace. The results of probing could be utilized, for example, in building teams. The students mentioned that moving in with a significant other is usually a complex situation in which each partner's furniture and decor are forced to blend. This negotiation would be easier after a probing process in which each partner's preferences for the dwelling are conceptualized. According to Sanders and Stappers, 'as a pre-design phase, probing aids in understanding people's experiences in the context of their lives: past, present and future dreams' (2014: 11). This emerged also in the present study as applications to therapy or life coaching were found: one could examine one's life through probing it.

According to the students, the probing method was considered as being useful for collecting user information from groups of users who were not capable of communicating with words, for example, handicapped persons. In a study of Jacobson and Pirinen (2007), the kinds of elements that contribute to the disabled persons' holistic user experience in the domestic experience were examined. The study found that the *pleasure* aspect in the environment might entail less accessible and safe solutions, such as choosing a bathtub instead of a safer shower. The *personalization* aspect of accessible solutions pertains to lifestyle and the aesthetic qualities of the solutions, such as personalizing an assistive device to indicate the lifestyle of its owner (Jacobson and Pirinen 2007: 162–64). The aspect of *personalization* in domestic interiors appeared in this study even as a main purpose of one students' probing process, which was a better presentation for the many souvenirs in her home, whereas the *pleasure* aspect was related, for example, on choosing a more comfortable sofa in the living room to concentrate on work instead of more isolated study or a desk.

## Discussion

Mattelmäki (2008: 77) defines the probing as a 'playful co-exploring method that combines both designers and non-designers in the field of design'. In this study, the probes were applied in analysis mainly of home interiors and were strongly based on making and doing (participants taking photographs, drawing route maps, making collages, etc.), an approach that has recently become more and more important in design processes (Sanders and Stappers 2014). In design education students are encouraged to teamwork, creative problem-solving and seeking their own solutions to problems using a variety of activities and resource materials. Moreover, Frascara and Guillermina suggest including *the user* as one of the key factors in present-day design education (2012). According to them, design education 'has to be a design built around the user, with the user and for the user' (2012: 39). In this study, Vischer's (2008) theory of the user-centred approach of a built environment was applied. According to Vischer (2008: 239), we all 'share the ideal of a positive and supportive environment which enhances human activities and helps people fulfil their aspirations'.

The study found that from the user-centred point of view, using the probing method helped to *conceptualize* the variant qualities connected to the space as well as promoted to *create a dialogue* between various user groups as well as between designers and non-designers. The method also focuses on the feelings and emotions in learning process that need to be taken more seriously in current interior design education (Budd 2011).

The application of design probes in the study was in a compulsory, advanced-level course in interior design course with students training to become textile teachers. The motivation to participate in probing was stronger in students who had a real need to make changes in an interior than in those

who just completed the process for the credits. The students living in a dormitory had some problems with motivation to make actual changes to the interior because they knew they would not be living there for long term. Still, the topic of motivation was not straightforward. Even when probing a temporary home, the process clarified what the residents appreciated about the dwelling. Those who used the probe with children or teenagers felt that the method was especially fruitful with them, because children seldom take part in the design of domestic interiors – even for their own rooms.

The method chosen to the study was a case study that according to Merriam (2009: 51) has proven ‘particularly useful in for studying educational innovation’. It would have been possible to frame the study as an action research as well. In an action research, action and research are integrated in a series of flexible cycles (Somekh 2006). The topic of investigation is any positive changes – for example, in working practices or relationships. Planning and evaluation of action strategies is central in examining those changes and is usually carried out through further data collection (Somekh 2006). In this study the emphasis was more on students’ experiences from the two courses as a whole than approaching the data as two cycles and reflecting and analysing each separately. Multiple data sources in this study are used to strengthen methodological triangulation (Stake 1995).

The spaces probed were mainly home interiors. Home is an ambivalent space existing in relation to the public and social world, its norms and agreements, but at the same time being the most private area of one’s life (Johansson and Saarikangas 2009). In one evaluation lesson, we had a lively discussion on why we clean up before taking pictures of our home. A couple of students did not even want to show photographs of their home to other students, and so instead they used 3D modelling to present the space being probed. Some students felt that the method was too

complicated, arduous or vague; they suffered from a lack of motivation for the whole probing process, especially for self-documentation, which is done daily for a defined time and requires a big commitment. The challenge for probing processes in general is that the users participate in a relatively long and intensive process and may lose interest and commitment (Keinonen et al. 2008). In spite of this, probing was found to be a new and playful method in user-centred analysis and design of interiors. Furthermore, potential applications of the method to pedagogic and other areas were found, which are worth investigating in the future.

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