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UNDERSTANIDNG THE MAKING OF WEARABLE OBJECTS BY NON JEWELLERY DESIGNERS: A DESIGN LAB APPROACH

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ABSTRACT

This paper presents a research study with the aim to understand how non-jewellery designers approach a jewellery design task using a design lab approach. There is a need to gain a deeper understanding of the basic foundations of the jewellery design and making process. In related fields such as industrial and product design, research into the nature of making processes has contributed with new insights of how designers conceive new products. In contrast to other design disciplines, however, the user-centred value concept has not been adopted in jewellery design. In this study, therefore, participants took part in a jewellery lab design session with the aim of understanding how designers of other disciplines than jewellery designers approach a jewellery design task. The purpose of the study was to understand how non-jewellery approach the design task and how they conceive the nature and purpose of the wearable objects in comparison with typical jewellery designers' approaches. As none of the participants were jewellery designers, they may be regarded as end-users of jewellery. This study research was inspired by the participatory design approach in order to shed new light on the jewellery making process. The insights gained from this study challenges the current understanding of jewellery design and making.

Keywords: Jewellery design, user-centred, design lab

1 INTRODUCTION

Jewellery design practice is a specialised knowledge field, integrating aspects of designing and making. Designers engage in a range of design activities, which involve processes of conceptualising, experimenting, modelling, prototyping and making (Young, 2010). This field engages designers who combine artisan skills with knowledge of basic metallurgy, gemstones, and visual language. In jewellery design practice, designers work with different materials in a variety of different ways (McGrath, 2007), while making use of a range of principles, techniques, tools, and methods.

Jewellery design practice aims at creating ornamental objects, art forms or jewellery objects with the purpose "to enhance and decorate the wearer" (Galton, 2012). Since ancient times people make jewellery because they are passionate about "materials, the challenge of constructing pieces with inevitable problem-solving, a strong desire in creating own designs and expressing ideas" (Eddy, 2010).

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Understanding the making of wearable objects by non-jewellery designers: A design lab approach

Noor Adila Mohd Rajilia and Anders Warell

Contemporary jewellery design incorporates theoretical, cultural, conceptual, historical, material and artistic components in the practice. These aspects have influenced and shaped the practice of jewellery making into a field in which designers communicate their ideas and convey their self-image and identity through their jewellery work. In fact, the use of materials is unlimited, for example designers use alternative materials including recycled, collected, and natural objects (Galton, 2012) in producing jewellery. The use of these types of material has the power to inspire designers in their creative processes and to add novel value to jewellery.

While the tools and materials of jewellery design are well known and commonly taught in design schools, how jewellery designers think and reason in the practice of design is not well understood. As stated by Lawson (2004), “the common features in the kind of knowledge designers rely upon are indeed rather special and in some ways rather unconventional”. As such, there is a need to deepen the understanding of how knowledge dissemination occurs in the practice of jewellery design. In this context, knowledge dissemination is related to the transferring and sharing of knowledge to others (Gagnon, 2011), such as customers or students who are studying jewellery.

Based on the perceived lack of research in the field, jewellery design considered being less understood in comparison with more established design fields such as industrial and product design. In order to examine and explore the foundational principles of jewellery design, a design lab was organized. Designers of disciplines other than jewellery design were engaged in creating wearable objects to shed light on fundamental questions related to jewellery design. As non-jewellery designers, these participants are thus also considered potential end-users of jewellery.

Consequently, the design lab approach taken in this research is inspired by the participatory design approach. The design lab rests on the ‘say-do-make’ model of Sanders (2002), see Figure 1. As professional jewellery designers have conventionalised ideas about their practice, we engaged non-jewellery designers as participants to provide them with the opportunity to design outside their own field of practice. As such, what they say about the work may be more similar to how people in general would describe jewellery making. What they do may reveal new insights into making, not conventionalised by ‘typical’ jewellery making, but flavoured by approaches found in other design disciplines. Finally, what they make would be influenced by their previous experience and thus unrelated to the domain of jewellery design, yielding a novel approach to jewellery making. Thus, we expected to gain new insights into jewellery making, which we could not reach by engaging jewellery designers (or conventional users and customers) in the same type of task.

The purpose of understanding of how non-jewellery designers make wearable objects is to explore the relationship between how ideas are generated and what a piece of jewellery can be. In the context of this study, wearable objects are referred to as decorative objects, which can be put on any part of the human body. Examples of wearable objects that are typically produced by jewellery designers are neckpieces, headpieces, and hand piece accessories. In the context of product design, wearability can be defined as “the physical shape of wearables and their active relationship with the human form” (Gemperle et al, 1998). Some examples of wearable products are headphones, eyewear, and masks.

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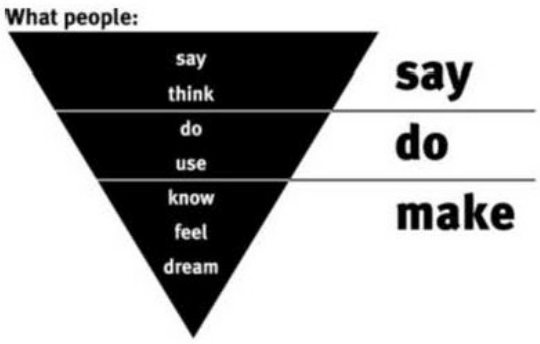

Figure 1. The say-do-make model (Sanders, 2002).

2 METHOD

The starting point of this study was to explore how jewellery-making processes of non-jewellery designers are different compared with typical processes of jewellery designers. A design lab session was organized, which had the purpose of exploring:

1. The nature of wearable objects, including characteristics and modes of wearing, as envisioned by non-jewellery designers.

2. The purpose of wearable objects, including function and value.

3. Design approaches, including activities for idea generation and prototyping.

The theme of the lab was “From Trash to Pleasure”. The materials used in the design process included artificial and natural recycled objects provided by the lab leader and were chosen because of their characteristics; easily sourced, inexpensive, eco-friendly, and conveniently transformed into wearable work. Examples included bottle caps, tree sticks, ice-cream sticks, chocolate and ice-cream wrappings, pineapple leaves, orange peels, old newspapers, toilet paper rolls, food boxes and aluminium foil boxes. Besides recycled raw materials, participants were also provided with additional materials such as steel wire, cotton string, and plastic string. Furthermore, participants were provided with basic jewellery making tools such as wire cutters, round nose pliers, chain nose pliers, flat nose pliers, scissors, cutters, super glues, and stationery sets.

Nine participants took part in the lab session. None of the participants were jewellery designers, although as students, professionals or teachers in the fields of industrial design, product design, or interaction design, they had previous experience of design work. The participants were divided into five groups, each group with two participants, except for one group with one participant. The participants were instructed to make wearable objects from the provided raw materials previously described. Each group was instructed to produce at least one wearable object, and was also free to choose whether they wanted to work together in creating both objects or individually produce each item. The duration of the lab was approximately two hours. A lab leader (the main author of this paper) guided the participants through the design lab process.

The lab leader studied the work of the participants through observation. The observation was complemented with video recording, picture and field note taking in line with Taylor-Powell and Steele’s (1996) suggestion that ‘seeing and listening are key to observation’. The observational studies supported the lab

leader in perceiving and documenting activities during the lab session. In documenting the activities, aspects such as the characteristics of participants, their interactions, non-verbal behaviour, physical surroundings and the emerging products were observed, following Cloutier et al. (1987) in Taylor-Powell & Steele (1996). Additionally, short verbal interventions were conducted during the session to provide information about the participants' activities, thinking and making.

3 DESIGN LAB SESSION

The lab was structured into three parts; introduction, making and conclusion. In the introduction of the lab, the lab leader presented the theme, aim and a brief of the lab session to the participants. During the making stage, the hands-on-activities started with a 'blindfold game', which was followed by a wearable objects making process. The concluding part of the lab consisted of presentation and demonstration of the wearable objects produced in the lab.

3.1 THE MAKING PROCESS

The purpose of the blindfold game (Figure 2) was to create a fun and creative environment and to engage the participant in using the tactile and haptic senses to choose suitable materials for creating wearable objects, thus avoiding using visual cues only. The blindfold technique (Genco, et al, 2011, Nicolle & Maguire, 2003 and Athavankar & Mukherjee, 2003) was applied to facilitate the participants to use their mental imagery (Dahl, Chattopadhyay & Gorn, 1999 and Athavankar, 1997) in the materials selection process. In the game, one person put on the blindfold and picked the raw materials out of a box, while the other participant guided the person with the blindfold in picking the materials.

Figure 2 Blindfold game

Figure 3 Making process

Figure 4 Presentation

The process of making the wearable object (Figure 3) took about 60 minutes. Participants were free to explore materials and forms within their working pairs. Participants discussed, explored and recorded their ideas on papers.

3.2 PRESENTATION AND DEMONSTRATION

This final part of the lab took about 40 minutes. During the presentation (Figure 4), each group demonstrated and explained their wearable objects with respect to idea generation, nature, mode of wearing and purpose of their wearable objects.

4 ANALYSIS AND RESULTS

The analysis of the participants' activities in this study is informed by three main sources; a previously conducted literature review study (Authors, 2015a), an ongoing interview study (Authors, 2015b), and the personal and professional experiences of the lab leader as a teacher and practitioner of jewellery design. The analysis of the observational data focused on how the participants approached the wearable object making process, their thinking and reasoning, as well as how they experienced the making process.

Participants produced different types of wearable objects having distinctive aesthetic values and functional properties. The wearable objects produced included the following;

a) Large neckpiece made from a combination of materials such as tree sticks, pineapple leaves and steel wire (Figure 5 a);

Figure 5 a

b) Ring made of pineapple leaves and tree stick (Figure 5 b);

Figure 5 b

c) Ring finished with pineapple leaves (Figure 5 c);

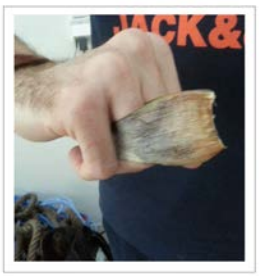

Figure 5 c

d) Head accessory created from orange peels and cotton string (Figure 5 d);

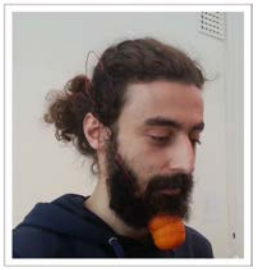

Figure 5 d

e) Hair accessory using pieces obtained from an aluminium foil box (Figure 5 e);

Figure 5 e

f) Headgear made from a combination of aluminium lunch box pieces and steel wire (Figure 5 f);

Figure 5 f

g) Eyeglasses accessory created from tree sticks, chocolate and ice-cream wrappers, steel wire and pieces of plastic string (Figure 5 g);

Figure 5 g

h) Men's brooch made of ice-cream sticks and tree sticks, chocolate wrapper and plastic string (Figure 5 h);

Figure 5 h

i) Earring made of a bottle cap, pineapple leaves, chocolate wrapper and steel wire (Figure 5 i).

Figure 5 i

The design lab was designed to guide participants through four steps of the design process according to Table 1; (1) Idea generation; (2) Conceptualisation; (3) Model making and (4) Evaluation. As we found their categorisation suitable for the purpose of our study, we analysed participants' design activities based on the categories created by Ahmed et al (2003), who propose five categories of design activities describing differences between the approaches of novice and experienced designers. The categories were according to the following;

1. Thinking; the designers expressed their thought, e.g: 'visualise in 3D' and 'express difficulty';
2. Action, the designers carried out an action, e.g: 'gain understanding';
3. Pattern, the designers carried out a pattern of behaviour, e.g: 'use trial and error';
4. Design strategy, the designers used the approach to assist the design progress, e.g: 'consider issue', 'aware of reason', 'refer to past designs', 'question data', 'keep options open', 'aware of limitations', 'use intuition' and 'ask for reason'.
5. General activity, the designers carried out an action that did not support the design progress, e.g: 'ask advice' and 'express need advice'.

In our analysis, however, only the first four of the five of Ahmed et al's categories were used, since the fifth category was found to be incompatible with the purpose of this study.

In Table 1, three notations are used to highlight characteristics of participants' activities when compared to typical jewellery designers' activities:

- Radical: indicates that the way non-jewellery designers accomplish the task was significantly different from the typical jewellery designers' approaches.
- Novel: indicates that the way non-jewellery designers accomplish the task was quite similar to the typical activities of jewellery designers, but can inspire jewellery designers to engage with their work in novel ways.
- Conventional: indicates that the way non-jewellery designers approached the design work was similar to typical jewellery designers' activities.

	DESIGN PROCESS STAGES			
CATEGORIES OF DESIGN ACTIVITIES	IDEA GENERATION	CONCEPTUALISATION	MODEL MAKING	EVALUATION
Thinking (visualise in 3D and express difficulty)	Conventional	Novel	Novel	Conventional
Action (Gain understanding)	Novel	Conventional	Novel	Novel
Pattern of behaviour (use trial and error)	Novel	Novel	Novel	Novel
Design approach (Consider issue, awareness of reasoning, refer to past designs, question data, keep options open, awareness of limitations and use of intuition)	Radical	Radical	Radical	Radical

Table 1 – Characteristics of non-jewellery designers' activities as identified in the study.

Participants' activities were condensed and analysed with respect to significant activities across the group of participation.

The main findings of this paper provide insights into the activities of non-jewellery designers' making of wearable objects. In Table 1, the characteristics –

conventional, novel and radical – of the designers' activities during the lab session are illustrated in relation to the four stages of the design process (idea generation, conceptualisation, model making and evaluation). For example; in the idea generation process, only conventional characteristics were observed with respect to thinking. The two characteristics – novel and conventional – are typical of professional jewellery designers' activities. Both characteristics were used here as a means of comparing the non-jewellery designers to their professional counterparts. While radical or 'newness' characteristics was indicated about design approaches used by the participants in all processes. In the following, the results are illustrated and related to typical processes of jewellery design.

4.1 RADICAL CHARACTERISTICS OF NON-JEWELLERY DESIGNERS' ACTIVITIES

The ways non-jewellery designers conduct the jewellery task were radically and significantly different from the typical jewellery designers' activities. The differences in participants' processes can be exemplified by the design approach used in the design process. Together with their partners, participants conducted informal discussions and posed questions related to how to make the wearable object. This included what components and materials they should integrate in the object, the limitations of the components, and how to make the object functional. For example, participants tended to break away from traditional thought and create brand new perspectives, which in Graham and Bachman's study (2004), study is termed "a revolutionary idea." This can be exemplified in making wearable objects (an eyeglass accessory, Figure 5 g). The radical characteristics that were observed have the potential to inspire jewellery design processes by suggesting alternative ways of making jewellery.

4.2 NOVEL CHARACTERISTICS OF NON-JEWELLERY DESIGNERS' ACTIVITIES

Novel characteristics of design activity were found in all stages of the design process. This can be exemplified in the making a wearable object (Figure 5 d) that hangs on participant chin from his head bearing the statement, "it is better that you think more, and talk less". Participants tended to show a philosophical idea behind the wearable object, which Graham and Bachman (2004) describe as "living in the mind of the designer and can never be proven."

Participants were also observed testing their pieces with users during the design process by placing the objects on the user's neck for evaluation (Figure 5 a). In the lab design session, a partner in the design team acted as a user. In contrast to typical jewellery design processes, the user was involved in the making process before the final product was completed. In typical jewellery practice, customers are only involved in the specification stage, in which they discuss their expectations and needs. In rare cases, customers request to try on their items before they receive the final product. The non-jewellery designers' work with jewellery were quite similar to the typical activities of jewellery designers, but how they evaluate and test can motivate jewellery designers to engage in the novel ways with their work.

4.3 CONVENTIONAL CHARACTERISTICS OF NON-JEWELLERY DESIGNERS' ACTIVITIES

Conventional characteristics appeared in many stages of the design process. In the idea generation and evaluation processes, non-jewellery designers visualised

the wearable objects three-dimensionally, which is also typical for jewellery designers. Through adopting a problem-solving approach, participants were able to overcome some of the difficulties during the conceptualisation stage by combining different types of materials and conceiving a mechanism connecting different parts. For example, participants created a male brooch (Figure 5 h), which hangs on the neck and is fastened without the need for a pin. Participants also tended to imply derivative ideas in their wearable objects, by taking something that already exists and adapting it to their new needs. For example, participants created an earring that is placed close to the face, instead of hanging freely as a conventional earring (Figure 5 i).

Participants were also observed employing trial and error in their process of making a neckpiece (Figure 5 a), which resulted in several iterations. For example, they exhibited the design pieces with the correct balance, comfort of wearing and joining systems. They made decisions on how to improve their design and implemented the adjustments in the next iteration. This process is very typical of jewellery designers who often use trial and error-based approaches.

5 DISCUSSION

The design lab was conducted with the purpose of exploring how non-jewellery designers approach the design task of creating wearable objects. Specifically, we were interested in understanding (1) how they conceptualised the nature of the wearable objects, including characteristics and modes of wearing; (2) how they explored the purpose of the objects, including function and value; and (3) their design approaches, including activities for idea generation and prototyping. These aspects are discussed in the following.

5.1 THE NATURE OF WEARABLE OBJECTS

Most of the participants produced wearable objects that are typically created by jewellery designers, for example neckpieces, rings and head accessories. However, the participants were also able to produce unique and innovative types of wearable objects, for example an eyeglass accessory and a men's brooch. In fact, aspects of novel thinking was evident all pieces produced by the participating non-jewellery designers. For example, a large neckpiece (Figure 5 a) was created featuring decorative elements, which can be worn either on the front or the back of the body. This is an example of flexible use, which caters for different types of behaviour and preferences.

5.2 PURPOSES OF WEARABLE OBJECTS

Participants produced product ideas that included wearability aspects, for example products related to mobile phone and military applications (Gemperle et al, 1998). Participants were observed designing and placing earring (Figure 5 i) on their ear, which resembles an earphone concept.

5.3 DESIGN APPROACHES

Typically, industrial and product design practices exhibit a structured or systematic approach. In the lab, some of the participants were very systematic in their process, for example in the making of the eye-glass accessory (Figure 5

g), which exibited a trial-and-error based approach including brainstorming technique in the selection and the use of materials, indicating the use of multiple approaches in their work. By observing how participants engaged in the making process, driven by their conventionalised ideas about design processes, thinking and making, we explored what Lawson (2004) describes as "knowing by doing."

5.4 INNOVATIVE APPROACHES TO THE PRACTICE

According to Graham and Bachmann (2004), ideas originate from our consideration of scientific, business, artistic, or individual bases of innovation. In this work, we have adopted five relevant categories from Graham and Bachmann (2004) to categorise the types of innovation practices participants exhibited in their processes, according to the following;

1. **Problem solution;** "tries to solve a problem and represents one of the most prevalent";
2. **Derivative idea;** "improves something that already exist";
3. **Revolutionary idea;** "breaks away from existing thought and provides a completely new perspective";
4. **Artistic innovation;** "is created as an expression of an artistic impulse";
5. **Philosophical idea;** "ideas that can never be reduced to practice and live only in the minds of their creators and those with whom they share it".

Examples of the five relevant categories of innovation are illustrated below, in relation to the nature of the design result with respect to the level of 'newness' of the idea (refer to Table 1):

1. **Problem solution (Conventional result)**; designer has found a problem and as a result, solves it. For example, participants created a male brooch, which hangs on the neck and is fastened without the need for a pin (Figure 5 h).
2. **Derivative idea (Conventional result)**; designer taking something that already exists and changes it. For example, participants created an earring that is placed close to the face, instead of dangling freely as a conventional earring (Figure 5 i).
3. **Philosophical idea (Novel result)**; the philosophical idea lives in the mind of the designer and can never be proven. For example, one of participants created a wearable object that hangs on his chin from his head bearing the statement, "it is better that you think more, and talk less" (Figure 5 d).
4. **Artistic innovation (Novel result)**; disregards the necessity for practicality and holds no constraints. For example, participants make a large neckpiece, which features three-dimensional elements and can be worn on the front as well as on the and back of the body (Figure 5 a).
5. **Revolutionary idea (Radical result)**; breaks away from traditional thought and creates a brand new perspective. For example, participants created an accessory, which hooks on to the frame of the eyeglasses (Figure 5 g).

The above categorisation illustrates that non-jewellery designers employed the full range of innovative practices during their work with the design lab. Furthermore, it suggests that the framework of Graham and Bachmann (2004)

may be possible to guide design work in terms of suggesting various types of innovative principles to be employed in different design situation and tasks. As such, the categories may constitute a starting point for supporting innovative practice in jewellery design.

The experience and role of the lab leader as a researcher, teacher and designer in the jewellery design field are also important for evaluating the work of the participants. Activities involved both designing and making processes such as how participants choose and use the material given in the lab, how they generate ideas for making wearable objects and how they translate their ideas into the objects with respect to their approaches, interests and skills. The background of the lab leader facilitated the analysis of participants' activities.

6 CONCLUSION

This study is a starting point to gain an understanding of the value and potential of a design lab approach for user innovation and making in jewellery design. Furthermore, the user-centred value concept in jewellery design has not previously been explored in research. In contrast, user-centred concepts have been widely adopted in other design disciplines such as industrial design and service design, which has contributed with value and relevance in those fields.

In conclusion, the study contributes to knowledge in terms of:

- Learning from the non-jewellery designers' ways of thinking and working with wearable objects.
- Providing insights into alternative ways of making wearable objects designed by non-jewellery designers. This is related to the challenges of creating wearable objects, including how they explore the materials, how they think about joining systems, functionality, integration with different types of materials, and how they generate ideas and get inspiration for their wearable objects.
- Questioning the status quo of wearable objects such as designing, making and wearing.

This study will set the stage for future investigations on how jewellery designers can benefit from employing design lab based approaches in their work. Therefore, future work will consider including participants from different backgrounds, in order to study how they, as users, perceive jewellery and adopt various approaches in making jewellery.

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