How to Design for Emotions: Experiences in a Course

Erdem Demir* Pieter M. A. Desmet* Değer Özkaramanlı*

* Delft University of Technology, Faculty of Industrial Design Engineering, Delft, The Netherlands, e.demir@tudelft.nl, p.m.a.desmet@tudelft.nl, d.ozkaramanli@student.tudelft.nl

Abstract: The appraisal approach has been demonstrated to be useful for designing with the intention of eliciting/preventing specific emotions, i.e. designing for emotions (DfE). This approach involves four main steps (1) specifying the design theme (the activity to design for, the target group, and the emotional intention), (2) identifying concerns of the target group, (3) generating a product profile that matches those concerns, and (4) designing a product conforming to the product profile. Although informative, these steps are described only in a general way. This article focuses on the specifics of the challenges that designers can encounter when following the steps in their design attempts. To identify the challenges, we referred to a DfE project that was conducted by 16 master level industrial design engineering students in Delft University of Technology. The aim of the project was to design interventions that elicit joy/happiness in the context of having dinner. Through our observations during the course, analysis of the students’ project reports, and two focus group sessions that were conducted upon the completion of the project, we identified six key challenges involved in this approach. In the paper, those challenges are presented and the ways to overcome these challenges are proposed.

Keywords: Design for emotions, appraisal, concern, life goals.

1. Introduction

One of the main objectives of the Design and Emotion field, is to support designers in their attempts to design with the intention to elicit or prevent certain emotion(s), i.e. ‘Designing for Emotions’ (DfE). A promising structure that can be used as a basis for DfE, is provided by the appraisal approach. The application of this approach has been demonstrated in various design cases, covering both redesign and new product development [1-4]. An example of a redesign project involved the design of a catering packaging for in-flight use for an airline company [4]; while, ‘enriching airport experiences’ (setting and designing for emotional intentions within an airport context) [3] is an example of a project with a focus on new product development. The scope of the latter case was much broader compared to the former one due to the following factors: (1) the domain to be analyzed was larger, (2) the emotional intention was not set, and (3) the product to be designed was not known at the beginning of the project.

Although the cases presented in the literature are informative in how they describe the various steps involved in the appraisal design approach, they do not provide much detail in how to take these steps, what challenges are involved, and how to overcome these challenges. An example of such a challenge is to determine how to
identify, formulate, and select relevant user concerns – a key step in the appraisal approach. Our current objective is to identify these challenges and to propose some ideas on how to deal with them. The challenges discussed in this paper were identified in a five-week master level DfE course organized at the Faculty of Industrial Design Engineering of Delft University.

We will first discuss the main steps involved in the appraisal approach. We will then present the student design project, and discuss our observations of the challenges encountered by the students. The paper concludes with a discussion of opportunities for possible improvements that can help overcome the identified challenges. This research should contribute to our understanding of how theoretical insights in how products evoke emotions can be used in a practical design setting.

2. Approach

In the appraisal approach, [5], DfE starts with an understanding of the appraisals that evoke an intended emotion. Next, the concerns are identified that serve as references in the appraisal process. The envisioned appraisals and related concerns are then used to generate product concepts that evoke the intended emotion. In line with this approach, Desmet [4] proposed a set of four steps for DfE: (1) design theme, (2) concern profile, (3) product profile, and (4) product design:

**Design theme**

In this step, the designer identifies the main function of the product, the user group, and the situation in which the design will be used. The theme is defined in terms of a user group engaged in an activity in some situation, e.g. enhancing the experience of economy class passengers eating their breakfast in an intercontinental flight.

There are three main aspects of DfE projects that are to be set during this step, if not set previously. These aspects are: (1) the emotional intention, i.e. the emotion that should be experienced by the product users, (2) the design domain, i.e. context, situation, and corresponding activities, and (3) the object of design, i.e. what to design. In some projects, the emotional intention is not given at the beginning of the project and is set during the process. The emotional intention can be specific (e.g., design for fascination [2]), or more general (e.g., design for pleasure [4]). Furthermore, some DfE projects start with a particular usage context without a defined emotional intention or particular product to design [3]. Likewise, some other DfE projects are defined as redesign projects in which the objective is to improve an already existing product by adding an emotional value [4].

**Concern profile**

The concern profile represents the goals of the intended user. The objective is to generate a list of goals that is relevant for the case and inspiring for the designer. We distinguish three focus types for goals: (1) product goals, (2) activity goals, (3) life goals [see also 6]. Goals with a product-focus are about one’s preferences regarding products, such as a table made of wood, or an exclusive sound quality of a music player. Goals with an activity-focus are what one wants to achieve with the activity one is engaged in, in the design domain. For instance, if we want to design a communication device, we may want to identify concerns such as expressing oneself clearly. An important issue is that concerns differ between situations. For example, in a public space someone may want to keep silent while communicating, whereas this may not be an important concern when this person is at home. Finally, goals can also focus on our lives and ourselves: we may want to get promoted in our jobs, see our
grandchildren on holidays, or leave time for leisure in our lives.

Goals can be formulated with changing degrees of abstractness within each level of focus type. When a goal is formulated in abstract terms, the meaning of the goal is not fixed and how to realize the goal is not clear in the formulation, e.g. “I want to experience sensorial pleasure”. The goals can also be formulated in a concrete manner, implying a particular action “I want to eat a piece of that chocolate cake that has been flirting with me since I entered the patisserie shop.” Goals with different abstractness/concreteness level are related to each other in a hierarchical structure [7], in which concrete goals are at the bottom of the hierarchy. Therefore, attainment of concrete goals may lead to the realization of connected, yet more abstract goals, e.g. “I want to have dinner with my loved ones, in a good restaurant” will undoubtedly fulfill the goals “I want to be connected to my loved ones” and “I want to eat good food.” Likewise, an abstract goal can be satisfied by attaining different concrete goals. For example, “I want to be physically healthy” can be reached by “I want to do regular exercises” or “I want to eat healthy food.”

**Product Profile**

The product profile represents the designer’s vision on how to align the product idea with the concern profile. The outcome of this step is a statement that specifies the product’s character, intention, and significance. The product’s character is about the appearance of or the qualities of interaction with the product; and it aims to address product focused goals of the target user. The product’s intention is related to the usage of the product, i.e. what the product does and how it does that, and aims for the attainment of activity focused concerns. Additionally, usage of the product has consequences in the life of the target user, i.e. product significance, which explains which life goals the designed product can enable/force/help/seduce the user to attain. For example, in the product statement: “I want to design a flirty product that helps me to feel connected to my loved ones by seducing me to effectively share my daily life with them”; the significance of the product for the user is to ‘feel connected to my loved ones’. The product intends to do that by ‘seducing me to effectively share my daily life with them’; and the product character is represented by the adjective ‘flirty’. To specify what the product should do for its user to attain the specified life goal, one should answer the question “how can the life goal be attained?” Answering this question involves generating stimuli which enables the user to attain the specified life goal. For the previous example, sharing daily life with loved ones is just one way to attain the goal of feeling connected to loved ones. Other stimuli may be talking on the phone, remembering inside jokes, etc.

**Product Design**

The last step is to design a product that fits with the product statement. For this, various interesting and inspiring stimuli that align with the product profile are generated. The rest of the design process involves materializing the product ideas into product designs, and consists of decisions on product materials, colors, packaging, texture and so on; all of which refer back to different types of concerns initially defined in the concern profile.

Although inspiring, these steps lack detail regarding the decisions that need to be made during the design process. Such important decisions consist of selection of appropriate concerns, generating stimuli that may help to attain selected concerns, and translating these stimuli to a product idea. In the next section, we present our observations on challenges encountered during a specific DfE project in a course focusing on product concept generation.
3. The description of the project and methodology

In order to identify the challenges in DfE processes, we refer to a five-week project that was conducted in a master level design course in Industrial Design Engineering Faculty of Delft University of Technology. Sixteen students followed the project. The aim of the project was to design ‘something’ that evokes joy/happiness in the context of a dinner situation. Students were instructed to select a specific person to serve as the product user. This should be someone who they have access to, like a good friend of a fellow classmate. We focused on a broad design domain (dinner experiences) instead of a particular product to be able to identify the challenges in a more complex design setting. Students were free to focus on any activity relevant for dinner situations, e.g. preparing, serving, eating, cleaning up, and to any context, e.g. dinner at home, dinning out, dining alone or with people, etc. The particular activity that each student designed for was specified simultaneously with defining the concern profile and product profile.

The project started with developing a concern profile. The appraisal that elicits joy/happiness involves a certain motive/goal consistency [8]. This appraisal pattern indicates that one should identify goals to design for joy/happiness, goals referring to our concerns focusing on what we want in life. As mentioned before, goals may be about our life, a specific activity, or a product. In our earlier work, we saw that attainment of life goals is more likely to evoke joy when compared to the attainment of activity or product focused goals [8]. Therefore, students were asked to identify and design for life goals of the target person at the beginning the project.

To help students with formulating their concern profile, we provided them with goal taxonomies that propose abstract goal categories such as belongingness, autonomy, physical well-being, and so on [9-10]. Using a questionnaire [11], students identified the concerns underlying the most joyful/happy event that their target user experienced in the past six months. This particular event was used to initiate a discussion on the important life goals of the target person. Finally, a life goal statement was formulated that consisted of one or more of the life concerns of the target user. After this phase, students were asked to translate the formulated life goal statements to product statements by envisioning stimuli that matches the life goal statement. Finally, they developed product ideas. The overview of the concern profiles, product profiles, and product ideas that are formulated in this project are provided in table 1.

During the project, the progress of the students was monitored with three feedback sessions. Following the completion of the project, students submitted a report in which they documented their design process and presented the challenging parts based on their own experiences. Additionally, two focus group sessions were conducted, one with three and one with five students. Each session took approximately an hour and started with sensitizing the students by reminding them of life goal statements and product ideas that they developed. This information was extracted from their project reports prior to the focus group sessions. Following the sensitization stage, we asked participating students about the alternatives that they generated during the main phases of their design process; such alternatives were explained as being related to (1) life goal statements, (2) product statements, and (3) product ideas. We discussed the rationale behind their decisions regarding different alternatives, and we asked them to specify the challenges that they mentioned in their project reports.
Table 1. The overview of the students’ projects

<table>
<thead>
<tr>
<th>Concern Profile</th>
<th>Product Profile</th>
<th>Product Idea</th>
</tr>
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<tbody>
<tr>
<td>1 &quot;I want to remember my old friends and stay in touch with them, even when I move away.&quot;</td>
<td>I want to design a simple and easy-to-transport product that will make my user remember his old friends by using the objects created by them regularly.</td>
<td>A customizable set of cutleries which are shaped by good old friends from previous living places. The cutlery made by the friends represent them and in dinner environments they help recalling them.</td>
</tr>
<tr>
<td>2 &quot;I want to travel the world for intellectually stimulating experiences.&quot;</td>
<td>I want to design a product that will intellectually stimulate my user (significance) by giving information about the origin of the food (evoking a travel experience-intention)</td>
<td>A closed platter with two openings serving a mix of multicultural food, when particular type of food is served the music of the culture where the food comes from plays. With the music and the food, the mind travels to that culture.</td>
</tr>
<tr>
<td>3 &quot;I want to be able to be certain about and argument my decisions well&quot;</td>
<td>I want to design a neat and good-looking product that will help my user avoid failure when setting the table in a practical way.</td>
<td>A tablecloth with patterns marking the location of each of the objects used at a dinner table and allowing people to write text.</td>
</tr>
<tr>
<td>4 &quot;I want to be likable, I want to avoid rejection by others.&quot;</td>
<td>I want to design a product that will make my user feel comfortable with someone he does not know well by forcing them to make fun of each other.</td>
<td>A table where the objects on the table (glasses, cutlery, etc.) are tied to each other underneath the table creating amusing interaction moments among two people having dinner together.</td>
</tr>
<tr>
<td>5 &quot;I want to show the world how competent (working concretely and effectively) I am as a designer.&quot;</td>
<td>I want to design a practical and efficient product that enables my user to show his competence by making the moment of serving food a highly fascinating and pleasantly surprising one.</td>
<td>A semi-transparent box-shaped serving plate that, when the lid is lifted, reveals the food inside and the cutlery sets itself on the table in one, sudden, surprising moment during serving.</td>
</tr>
<tr>
<td>6 &quot;I want to have control, over myself and over my communication with others.&quot;</td>
<td>I want to design an unobtrusive product that enables my user to enhance his control by helping him to practice subconscious tricks over his dinner guests.</td>
<td>A set of placemats that can contain desired visual or textual material to create subconscious behavior only observable by the user during dinner.</td>
</tr>
</tbody>
</table>

4. Challenges in DfE

In our observations in the feedback sessions, the student project reports, and the focus group interviews, we identified the following challenges in design theme, concern profile, and product profile steps. We excluded the challenges in the product design case as this step is a commonly addressed in the design literature.

Challenges in the first step: specifying the design theme

Focusing on a particular activity to design for

As this project started with formulating a life goal statement instead of analyzing the activities in the design domain, students focused on a particular activity only after they formulated the life goal statement that they wanted to design for. The lack of a particular structure in identifying different activities and the situations in the design domain confused students. One student explained: “Before knowing the particular concern it was very cloudlike. I can do something for the preparing, I can do something for the dinner, it was quite confusing.” (Student 4)
A recurring observation was that the students did not generate and document many alternatives for the activities (e.g. preparing/ serving/ eating) and the situations within those activities (eating in a restaurant/eating at home with friends/eating a romantic dinner) that their life goal statement could be translated to: "I just went through a dinner situation, when people are coming, having dinner, washing the dishes, and I just looked at each of those steps and see how my idea could fit in." (Student 6)

Therefore, they were fixated on one phase of the activity based on their initial goal statement, even after the initial goal statement changed. Furthermore, some students used the activity concerns of their target person to focus on a particular activity. What we observed was that when the user defined an activity-focused goal, the identified concerns were used as facts to select a particular activity to design for. For example, one student reasoned with his choices as follows: “So when I was asking him questions, I was asking like so would you like a special dinner with your girlfriend, or would you prefer a pot lock dinner with lots of friends...” (Student 2). This strategy can be helpful in reducing the solution space and complexity of the problem; however, it can also cause fixation on a particular activity.

**Challenges in the second step: generating a concern profile**

*Judging the appropriateness of the life goal statement*

The appropriateness is the extent to which a life concern can be translated to a product profile for the focused design domain. We observed that life goal statements that were generated without considering the inherent qualities of the domain can lead to interesting product ideas. The statement “I want to remember my old friends...”, for example, resulted in an idea of a souvenir cutlery set of which the handles can be shaped by user’s loved ones (Student 1). However, when not starting from the qualities of the domain, students were often not sure of the appropriateness of a life goal statement. In some cases, students were stuck with goals that did not suit the dinner experience, e.g. “After my studies abroad I want to go back to Colombia and show that I am a skillful professional.” (Student 1).

*Judging the importance of a life goal statement*

Attainment of an important goal is more likely to elicit joy/happiness than attainment of a goal that is relatively not so important. Most students strived to select life goals that are important for their target person. Some of them used permanence of the goal as a sign of importance. For example, Student 2 justified the selection of his goal statement (I want to travel the world for intellectually stimulating experiences) as follows: “…There were other goals like ‘getting university degree’, but they were even more temporary; this (the selected goal) was something like part of his personality so it would change slightly... but it would be still with him, that explorative nature...“ (Student 2)

Some students experienced problems with relating the importance of a life goal statement to the design domain. When specifying an important and evocative life concern for the design domain, the evocativeness may decrease. For instance, a student formulated the life goal statement as “I want to be sure of my decisions in my life.” However, this goal seems to be more about the major decisions in life. When this goal is specified for dinner situations as: “I want to be sure about the decisions made during food preparation process” (Student 3), the importance and evocativeness of the goal decrease significantly.

*Formulating the life goal in a helpful and interesting abstractness level*
Some students attempted to use the abstract goal categories provided in the psychology literature (e.g. belongingness from Ford and Nichols [10]) and had a difficult time in specifying what these abstract goals may mean for their particular user. For example, Student 4 who focused on designing for the abstract goal of belongingness stated: “It was difficult for me to find a specific meaningful goal, what belongingness means for him, and how I could use it...” (Student 4)

**Challenges in the third step: generating a product profile**

**Generating helpful stimuli**

The students stated that translating the concern profile to the product profile was the most difficult phase. Most of them attributed the difficulty to the abstractness of the life goal statements. Some students could not come up with a product profile directly. Student 4, for example, mentioned: “I found it very difficult to translate my goal (concern profile) into an idea...”(Student 3), “…If you really have to design something, you need to have a specific one (product profile), and for me it was the most difficult part.” We argue that this difficulty arose because students did not spend time on generating stimuli that meet the selected life goal. Being fixated on one stimulus, without spending much time in exploring others can result in stereotypical assumptions about the user. For example, one student (student 2), who focused on learning about different cuisines and cultures as a stimulus, explained: “There were other thoughts on ways to stimulate intellectuality (concern profile), but I quickly shortlisted them, I did not spend much time on them... Because... for this survey, he was in a very specific situation, he was in an exchange trip and he was travelling. He was meeting new people... So it was an immediate reaction to his current situation.”. The challenge here is to understand the need for and generate more inspiring stimuli.

**Formulating an explicit product statement**

Most of the students were not clear about the character and intentions of the product in satisfying the concern profile. The products have a certain character, which may be related to its appearance or the qualities of the interaction it suggests, e.g. delicate, engaging, playful and so on. Additionally, the product may enable, help, or force the user to attain a goal. However the different components of product character and intention were not mentioned in the product statements. Sometimes, there was no explicit product statement, which made it difficult to generate product ideas: "Translating my product idea into a concept was the worst step that I made. I had a good idea but looking back at it, I knew what I wanted to design but I could not design it in the intended way.” (Student 6) Even though students did not generate explicit product statements, some of them felt the need to come up with a list of product specifications: “I just started with a product idea and I thought of some rules in my head, and I thought it was good enough.” (Student 5)

**5. Discussion**

In this article, we identified several challenges that were involved in following an appraisal approach in DfE projects. These challenges can be grouped under two main categories: (1) challenges in relevant for constructing a concern profile and (2) challenges in generating product ideas based on the concern profile.

The first challenge was about selecting a life concern that is both appropriate, (i.e. can be met within the boundaries of the focused design domain), and important (i.e. meeting the concern would be emotionally evocative). The appropriateness of a life concern can be reached by tuning the abstractness-concreteness level of
the concern formulation. We propose that starting with abstract concern formulations, such as “I want to feel connected to my loved ones”, will enhance creativity. In cognitive science literature, it has been shown that abstract concepts activate larger conceptual networks than concrete concepts do [12]. That is to say, abstract formulations of concerns may allow an expanded search and may lead to varied product ideas. Earlier studies have shown that abstractness of the problem formulation lead to generation of more original ideas and solutions [13].

Although abstract concepts enhance creativity, they eventually have to be made more concrete so that they can be translated to product statements and eventually to product ideas. The crucial issue here is answering the question of ‘how an abstract concern can be attained in a particular design domain?’ A list of questions attempting to exploit the particular life goal statement should be asked. For instance, when considering the abstract goal of “I want to feel connected to my loved ones”; questions like “who are the people closest to you in your life?”, “when was the last time that you felt like you were a part of a group?”, and “when was the last time that you felt loved?”, may help in deconstructing an abstract life goal statement into more specific and more appropriate set of concerns.

When a concrete formulation of a concern that leads to a convincing product idea is not possible, i.e. when the concern is not appropriate; it can be further abstracted by asking “Why is it important for you to ... (the particular life goal)”. In our opinion, this abstraction could provide more appropriate life goal statements.

It is also important to assess the likelihood of the concrete concern formulation to evoke the intended emotion during abstraction-concretization. In case that one is too personally involved in a project, a logical way of being sure is to verify the importance with the target person.

The second main challenge was translating the concern profile to a product statement and product ideas, which involves envisioning stimuli. At this stage, designers can overcome this challenge by generating as many and as varied stimuli as possible. Various stimuli can be generated through brainstorming, generating scenarios where the designer envisions him/herself as the target person, or self-questioning. Another technique can be generating stimuli independent of the current context (dinner experiences, in this case) and trying to see if and how those can be translated to dinner experiences. However, generating non-stereotypical stimuli can be difficult as people may rely on a narrow understanding of the focused concern. A possible direction could be collecting stimulus cases, where the focused abstract concern was met in the context of target people’s lives. Hunter et al. [14] pointed out the importance of case-based knowledge in solving social innovation problems: The most original and high quality solutions are developed when case based knowledge is used together with more abstract information like schematic knowledge.

As a general observation, DfE with an unspecified product involves solving a complex problem. As mentioned in design theory and methodology, solutions to complex problems themselves are important aids for understanding the problem and reformulating it in a more appropriate manner [15]. In line with this argument, we observed that the linear steps of the process are hardly followed in a linear order in the DfE process. For instance, the decision to select a specific concern to design for is made only when the designer generates convincing product ideas. Additionally, the process involves numerous iterations among different steps. A main difficulty at this point is to keep track of the changes and problem reformulations and to remember the process of reformulating the concern and product profiles. To this end, we believe that specific and explicit statement cards
that summarize the main ideas and insights at every stage will allow the designer to keep track of the ambiguous insights until they are specified.

The study that is presented in this paper comes with some limitations. A particular difficulty was in keeping record of the design process and the decisions made in the context of the course. We believe that discarded alternatives for concern and product profiles, and product ideas, can be very insightful. Unfortunately we had very limited access to these discarded alternatives.

As a result of this research, two main categories of challenges encountered during the DfE process are identified. The first challenge is related to constructing a concern profile, and the second is related to generating product ideas based on the concern profile. In the future, we will focus on developing tools that can support designers in overcoming these challenges. These tools should assist designers in their attempts to identify abstract concerns that underlie the intended emotion and to generate inspiring stimuli based on concrete case knowledge about the situational factors that elicit those emotions.

**References**


