

# COMBINING RICH USER INTERACTION WITH THE PERSONAS TECHNIQUE IN A STUDENT USER EXPERIENCE DESIGN PROJECT

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## ABSTRACT

User-product interaction has evolved dramatically over the past decades and has been the subject of many research activities. In an era where electrical components are replaced by electronic ones, and where functional elements become so small that they can be built into almost everything, designers acquire an enormous freedom in shaping new products. Especially in the field of consumer goods, where designers integrate function, human-factors and aesthetics, this newly gained freedom offers numerous opportunities to design innovative products and interfaces.

This paper reports on a design course of 3rd bachelor students product development of the Artesis University College Antwerp in collaboration with the company Niko, a Belgium based company that delivers products and solutions for switching materials, door communication systems, lighting control and home automation systems. The design course 'user experience design' is an ideal context for students to gain insight in new interaction viewpoints such as 'rich user interfaces' and tangible interaction. It allows students to create design solutions that fit this young and emerging design philosophy. The design brief was presented by Niko as a kind of research by design approach: "rethink our digital remote LED strip control devices by researching new intuitive interaction solutions without displays or graphical interfaces". As a starting point, Niko introduced, by means of the persona technique, three different consumer types. The aim for Niko was not to collect short term applicable design solutions, but to get fresh and inspiring ideas from young and open-minded design students.

Final design results show an interesting variety of alternative interaction solutions for the traditional remote controls. Students succeeded in designing rich user interaction hardware and haptic interfaces and proved that the overall learning goals were achieved. For the students it was interesting to see that in-house designers of a rather technologic oriented company find it essential to think conceptually. The students were happy to learn that their jobs go beyond the hands-on technical and technological problems solving activities they encounter in their daily work.

From the industry perspective, Niko concluded that the collaboration with students broadened their view and confronted them with possible design directions they had not considered yet.

*Keywords: Rich user interaction, design education, personas technique, user centred design*

## 1 INTRODUCTION – RICH USER INTERACTION

The design and technical engineering of electric and electronic products and appliances have changed dramatically over the past years. The moment electric components were replaced by electronic ones, and their size decreased, designers gained more freedom in the design of form and shape of electronic devices [1]. What makes contemporary electronic products so fundamentally different from the ones before is the fact that the functional elements no longer determine the controls. This is in contrast with earlier products where the controls were inseparable from the functional parts. Thanks to the miniaturization of technical components, the human-product interaction is open to redesign, creating new opportunities and challenges.

A new aesthetic paradigm occurs. The meaning of beauty of a product is shifting from the aesthetics of the physical appearance (the hardware) towards the beauty of the combination form – interaction. Aesthetics of interaction have been research topics before by multiple authors [2,3,4]. Norman states that aesthetically pleasing object enable you to work better, and that "products and systems that make you feel good are easier to deal with and produce more harmonious results" [5]. Steve Jobs underlines

the same idea: “Design is not just what it looks like and feels like. Design is how it works” [8]. Frens [1] coined the term ‘rich user interaction’: this approach starts from the skills people possess and aims at an aesthetic interaction.

Tangible interfaces in lighting control have been studied before [6, 7]. Mason and Engelen [9] describe a user interaction design project where a tangible interface is used to control the lighting in a hotel room. The aim was to design a user interface (UI) that could be used easily by all hotel guests, regardless of their language or origin.

The user experience student design project presented here fits in with the framework of considering beauty in design as a merging of the aesthetics of hardware and interaction.

## 2 STRUCTURE OF THE USER EXPERIENCE DESIGN COURSE

### 2.1 General educational principles

The user experience design course represents a workload of 4 ECTS (European credits) and is compulsory for 3rd year bachelor students. The project focuses on the development of competences in user experience design as well as the integration of applied research. A qualitative and quantitative research method using statistical data processing based on a concept test was incorporated in the project. Educational guidance was generated by a multidisciplinary team of four staff members. Design input was given by Niko, a company that delivers products and solutions for switching materials, door communication systems, lighting control and home automation systems.

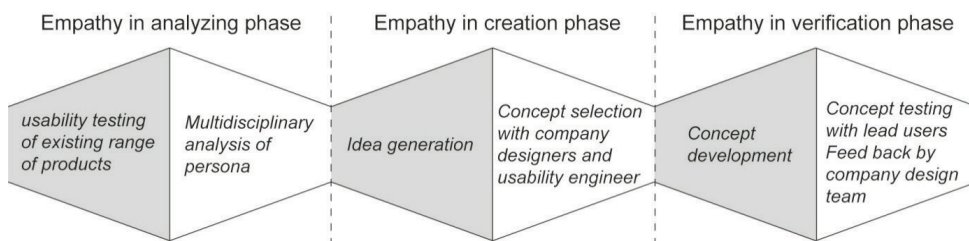


Figure 1. The adapted model for improved empathy

The educational model for improved empathy [10] is used as a starting point to ensure the integration of emotional awareness and empathy in the user experience, and to incorporate the expectations of the participating industrial company (Fig.1).

### 2.2 Briefing and input by Niko

“Design a new and innovative concept for controlling RGB led strips. We search for solutions with an intuitive interface that move away from the desktop paradigm. The remote should control following functions: turn on/off – reactivate the last colour composition – start and stop a colour loop – accelerate or slow down the colour loop – select a certain light colour – select the light intensity. The goal is not to design potentially commercial products, but to think about novel interfaces.”

Niko provided a range of existing LED controls for the students to test and to analyze, they determined the electronic components to built-in, and in-house designers joined the staff during design consulting. And, as a direct design input, they defined an extended description of three user archetypes utilizing the personas technique. Below: a short introduction to the three personas.

- Filip, a family man (married, one son) and ICT specialist with interest in house automation.
- Karen, a young law advisor, living together with her boyfriend. They love innovative, but affordable products.
- Agnes, age 50, single and living in an isolated dwelling. She is the proud owner of a jewellery shop. Character: extraverted intuition with introverted feeling.



Figure 2. On the left one the personas as presented by the company Niko, on the right a result of the empathy phase: a moodboard created by students to gain insight in the character and the preferences of the persona

Sixty design students participated and were evenly divided over the three target personas. Each of the students had to develop a dedicated LED control for a appointed persona.

In this exercise students worked partly individual and partly in groups of four. The initial analysis, the assimilation of the personas, and the final concept test were performed in groups. The specific product concepts were designed individually.

### 2.3 Empathy phase

In a preliminary phase Niko placed a number of LED controls at the student's disposal in order to research, test and discuss the existing range of solutions. This extended 'usability test' study was performed prior to the design course, during the course 'usability'. The main objective was to make sure that students gained insight in the user aspects and the problematic, cumbersome interfaces of the different controls in the market. The main conclusions were that most of the existing button-operated interfaces are not easy to operate, are counter-intuitive, and not aesthetically pleasing.

### 2.4 Market Segmentation Using the Personas Technique

Not every user responds in the same way to certain stimuli. Because consumers are different, each having their own character and motivations, market segmentation models and techniques divide consumers into different market segments with similar characteristics, according to certain parameters. Designers can optimize the user experience by adapting the design of the experience and the belonging hardware to the characteristics of the market segment concerned. In this design course, the personas technique was used. Personas are a set of fictional, representative user archetypes based on the behaviours, attitudes, and goals of the target group and can be considered as a stand-in for a unique group of people who share common goals. Personas are used to guide decisions about product features, navigation, interactions, and even visual design [11]. The criteria, benefits and advantages of the personas technique are underlined by many authors [12, 13, 14]. Brechin [15] states that market segmentation and personas are two complementary tools that organizations can use to design and sell successful products. For this design course Niko determined three personas. One of them is illustrated as shown in Figure 2. Complementary to the description of the personas, students composed moodboards and collages in order to fully apprehend the character of the appointed personas. Values and preferences were illustrated to determine what kind of user-interaction concepts, and hardware designs could please the persona.

### 2.5 Divergent and convergent creation phase

After the analysis and empathy phase (desk research, usability testing, moodboards, collages), each participating student generated different design ideas. These ideas were then merged in a set of three sufficiently different interaction design concepts. For each student, the concept they could finalize was selected by the supervising team (faculty, and designers and usability engineer from Niko). The design quality and the range or variation of solutions within one student team was taken into consideration. Each student presented his final design on a standard A3 storyboard concept card.

## 2.6 Results of the bachelor user experience design course

Thanks to the introduction of the different personas, and the emphasis on interaction as the main design topic, the design solutions show a wide variety. Some LED strip controls reflect in a very poetical way the norms and values of the persona involved; other results are designed as recognizable metaphors. The candleholder concept (Fig. 3) is designed for the Agnes persona and started as an abstraction of a classic candleholder. The candle is simplified into a slender rod, with a small ball on top to symbolize the flame. By moving this sphere up and down the light intensity can be raised or lowered. The loop is controlled by moving another little sphere through a discrete gutter; the loop is slow in the beginning of the gutter and accelerates when the shape of the gutter becomes more curved. The light colour is picked by placing a third sphere along the circle at the basis of the slender bar.

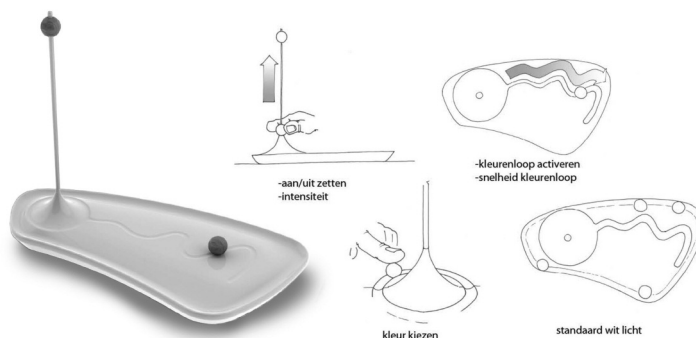


Figure 3. The candleholder concept for the persona Agnes

The Tri-C.L. concept (Fig. 4, left) is also designed for Agnes. The top elements act as valves for coloured light, and by turning the 'valve' clockwise or counter clockwise the amount of coloured light is added or removed. The loop is activated by turning the circular ring below around the base of the valves.

The Colour Cocktail concept (Fig. 4, middle) for persona Karen refers to a cocktail drink. The light colour is chosen by 'stirring': guiding the straw on top of the remote into the chosen colour direction. Light intensity is created by stroking the side of the cocktail goblet.



Figure 4. The Tri-C.L. concept, The cocktail concept and the Glow stick concept

The Glow Stick Concept (Fig. 4, right) for persona Filip uses the idea of a liquid based recreational glow stick (a single-use translucent plastic tube containing isolated substances which when combined make light through a chemical reaction-induced chemiluminescence). A slider along the side of the stick determines the colour; the loop is activated by bending the flexible stick into a closed ring.

## 2.7 Concept test with the end user - user empathy verification phase

Presentation concept cards were used to confront the potential users with the final design proposals. Using concept cards forced students to present their ideas in a simple overview, emphasizing the main

topics and aspects of their designs. A mutual graphical quality of the concept cards and illustrations was pursued to avoid preferences based on aesthetic differences in lay out or presentation.

In order to receive feedback of the target groups, each student team contacted 16 respondents to test their final product concepts. The research method can be described as semi-qualitative. Most of the questions were open-ended, but a content research on the product aspects was measured in a more quantitative way by using 5 point Likert scales. The qualitative part of the interview tried to capture the evoked product experiences at the three levels as described by Norman [5]. The perceptions of the visceral emotional processing level, the behavioural emotions and the reflective emotions were investigated in questions about the overall likeability of the remotes. The analyses and interpretation of the findings of the concept test resulted in recommendations for the further development of the designs and completed the project.

### 3 RESULTS & DISCUSSION

The overall set-up of the design exercise, the empathy enhancing activities together with the implementation of a qualitative and quantitative research phase, encouraged the students' creative and research skills. The personas proved valuable to link different user experiences to specific types of character. This is in line with the idea that, just like the product appearance, the user experience can be personalized and optimized for a specific target group. The rich user interaction approach forced the students to rethink the traditional user/artifact relationship and created opportunities for novel and innovative concepts.

The introduction of the three-step framework guaranteed that the empathy aspects were incorporated in the different phases of the design exercise analysis – creation – verification). The usability testing of existing remote controls, prior to the design exercise, proved to be an excellent introduction to the theme. The final concept test proved its usefulness in verifying the different design concepts, and in obtaining recommendations for further optimization.

The integral focus on the user experience and the collaboration with industry enhanced the students' insight that empathy should not only be pursued with users, but also with industry.

The collaboration with students confronted Niko with a forward-thinking innovative approach and provided the company with the opportunity to try out ideas that may not be perceived as having immediate commercial relevance. The collaboration kept the company in touch with a set of fresh-thinking individuals who are untainted by the limitations of having worked within the company for a lengthy period [16]. Collaborative projects provide the company the opportunity to meet students. They can communicate the way the industry works, thus preparing the students for their professional future.

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