Design for Emotional Well-being: A tactile and a material investigation

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Abstract
This paper presents how the research through design approach contributed to drive the exploration on design for emotional well-being on cognitively impaired children, who have visual and memory disabilities. A user understanding was gained through iterative process between research and practice. The tactile investigation and the responsible coupling between the physical and the computational materials are a key strategy to evoke positive emotions. The motivation is to define appropriate emotional effects through the combination of the physical and computational materials, and gather relevant user information, using video to reflect on the initial designs, to envision how these emotional effects can be achieved. Subsequently, it will support to design qualities in the interaction that evoke intended emotions among children and pedagogues. The outcomes are the tangible designs, the emotions’ evaluation and a compilation of written and visual annotations that describe the knowledge gathered from the design thinking of the research through design methodology applied along the project activity. Additionally, the findings obtained from the knowledge, grounded by the iterative process, can be viewed as an attempt to encourage designers and researchers to consider the emotional well-being topic that has gaining a steady interest in the design community.

Keywords
Emotional Well-being; Research Through Design; Cognitively Impaired Children; Physical Material; Computational Material (up to 5)

Scientific studies acknowledge Well-being is emerging as a guiding principle in design disciplines since last decade (Desmet, 2009). Each type of Well-being express an aspiration to explore how it can consciously contribute to the quality of life of individuals and communities (Diener et al, 2000). Designing opportunities for exploration and engagement in disabled groups in our society is to encourage them to face the real world with confidence, increasing their Well-being. Children that carry sensory impairments may experience illogical situations to them due to the sensorial deprivation they have. Without sensorial or multisensory stimulations, they are cut off from the outside world (Pagliano, 2012).

This paper is based on a one-year collaboration with a design research project of a design institution. I will reflect and discuss the knowledge in emotional well-being that was gained from the research, observations and how these parts shaped the iterative process along the study. The main discourse consists to present the method used along the project as well as how it contributed consciously to drive opportunities of engagement among these children and pedagogues. The purpose is to attempt to support emotional well-being moments; evoking joy, amusement and gratification that is needed to increase the self-esteem of the child. Evoking those positive emotions is an attempt to decrease uncomfortable feelings such as; anxiety, frustration, annoyance and disgust while these children are interacting with the tangible world. Furthermore, it attempts to their developmental process, attempting to connect mind and senses to better understand the concrete world. The context designed for is the Snoezelen pedagogical practice that will be explained in the “Context” section. The users are children, aged 6-16, with certain sorts of cognitive impairment such as; visual comprehension and memory disabilities. Snoezelen
pedagogues are the second target group since they must guide and foster confidence in children. They are staff members who can support the development process of cognitively impaired children. The tangible designs are seen as mediums that assist the emotional well-being exploration and are articulated in a design programme.

**Context**

Designing for a specific context means that designs need to be shaped according to the needs where these group of children and pedagogues are immersed, presenting potentials for positive experiences. The intention of the design research programme, is to allow children with visual and memory disabilities achieve better opportunities, with the concrete world through user friendlier tangible computing, as new forms of learning. The context designed for is the Snoezelen, described as a pedagogical and therapeutic practice that encourages cognitively impaired children to engage in sensory stimuli promoting the sense of well-being (Mertens, 2008). Snoezelen is a pedagogical practice introduced by two Dutch therapists, in the seventies of the twentieth century and it relies in non-verbal communication, encouraging a multi-sensorial experience through interactive artifacts and environments (rooms) (Pagliano, 2012). As Pagliano states, the practice fosters the reciprocal relation between the sense organs and the brain, encouraging children to learn how to perceive the tangible world (Pagliano, 2012). Cognitively impaired children may have the chance to learn through senses, developing their process of sense experience and assimilation of the sensory impression in their mental process. Pedagogues are sensitive to pace that each child has. They are committed to guide and foster confidence among children to use their senses in the most gratifying and effective ways in the Snoezelen rooms.

**Design for emotional Well-being**

Emotional or subjective well-being relates to the emotional and cognitive reactions to life situations (Diener et al, 2000). Reflections about the responsibility of designers to contribute to emotional well-being can be found throughout the design history. However, this topic has gained highlight only since the last decade. The first international conference on Design & Emotion, in November 1999, in The Netherlands, has brought a diverse group of designers, design researchers, as well as design thinkers, to share and discuss visions on the role of emotions in design (Desmet, 2009). Overbeeke and Hekkert were the initiators of this conference that presented their perspectives about design and emotions. This conference initiated the “Design & Emotion Society”. However, this event was not an isolated initiative. There has been an increasing and steady interest to research the field, as well as to develop methods and tools that facilitate the design process considering positive emotions as a background to responsive design, as well as design for emotional well-being (Desmet, 2009). The International Journal of Design dedicated a special issue, “Designing for subjective Well-being”, in August of 2013, presenting principles for well-being driven design, methods and approaches its assessment and impact in design.

Lyubomirsky, through her Well-being investigation, states that successful outcomes promote happiness in addition to that, her studies show that feelings of happiness links people to success (Lyubomirsky et al, 2005). Furthermore, some authors stated that a focus on the user experience could be facilitated by users’ involvement in the design process (Hummels, 1999; Redström, 2005; Overbeeke, 2007).

As Desmet states, empathy encourages a focused interaction and joy encourages a playful experience (Desmet, 2011). Evoking joy, amusement and gratification will encourage self-confidence as well as health social behaviors among cognitively impaired children.

It is within this setting, that is argued that positive emotions plays an important role that do affect cognitively impaired children, stimulating them to interplay and to accept the designs, attempting to develop their mental process and confidence to interact with the
outside world. Furthermore, it increases their self-esteem by decreasing uncomfortable feelings such as: anxiety, frustration and annoyance. Accomplishing, design for positive emotions is to encourage these children to learn from the tangible world, in a gratifying way, according to natural pace, promoting their confidence, achieving positive and rewarded experiences thus, improving their quality of life.

**A tactile and a material investigation**

Physical materials create the physical form, density as well as the surface of the objects in the physical world (Sonneveld et al, 2008). Tactile sense gives knowledge of the material world. It explores the interaction between the self and the outside through touch (Sonneveld et al, 2008). The tactile exploration is necessary for physical and mental development during the first phases of life (Pagliano, 2012). Tactile is also connected to haptic perception, which is the process of recognizing objects through touch. Moussette also situates in his PhD dissertation, *Simple Haptics*, that haptic perception is mostly an active exploration through touch, body movement and intentional engagement with the world (Moussette, 2012). Deckers, Wensveen and Overbeeke stated in PeR: Designing for perceptive qualities that our body is a touchable entity (Deckers et al, 2010). This paper presents one of the artifacts of a collection that aims to reflect about how design for perceptive behaviors is relevant to enhance the quality of interaction when designing sensitive artifacts. A physical contact with a surface initiates a sensory, emotional and cognitive experience providing an individual interpretation of the tangible world. Haptic tactile feedback possibly attempts to strengthen cognitively impaired children’s perception while they are probing an object for its tactile qualities. Computational materials can be defined as materials that are capable to sense and react according to user participation (Bergström et al, 2010). Since half of the twentieth century, Electronic developments in human-computer interaction, has accelerated new prospects for the computational material. Gradually computational materials became pervasive and gained new identities. New disciplines and research areas related to human-computer interaction have emerged. According to Dourish definition of embodied interaction, computer systems have become even more ubiquitous nowadays with a broad spectrum of social and tangible technologies immersed in our daily lives (Svanaes, 2013). As Redström presents in his doctoral dissertation “Designing everyday computational things”, interaction design emerged as a response to new design challenges (Redström, 2001). Accordingly, conceiving an artifact, in order to have a comprehensive meaning to children with visual and memory disabilities, it is required to understand first how physical materials behave in children’s hands with a responsible approach to then integrate the computational material. Together, these two materials have a united expression that forms the identity of the artifact and will encourage interactions that evoke positive emotions through tactile.

**Design method**

This section reports the design method applied in the project activity. The approach is the research through design that is defined as a research approach that uses methods and processes from design practice as a legitimate method of enquiry (Zimmerman et al, 2010). The knowledge obtained from the research through design approach contribute to see how these children interact to define the appropriate coupling of the physical and computational materials in order to encourage their engagement with the tangible world. Therefore, the understandings are grounded by iterative process between research and practice in order to create tangible designs that reflect the initial search. The purpose to provide emotional well-being moments is to decrease uncomfortable feelings or negative emotions as well as to encourage social behaviors among cognitively impaired children and pedagogues who participated in the design programme. Subsequently, relevant user information is gathered, using video to reflect on the initial
designs to envision how to evoke positive emotions such as; joy, amusement and
gratification. This approach will support to design qualities in the interaction that evoke the
intended emotions among children and pedagogues.
Research requires practice, so the tangible experiments reflect this exploration.
These experiments are supported by the quality of knowing; knowing in action, and they
are constructive design research (Schön, 1987).
As Schön states, practice supports reflecting the knowledge gained from the field, to then
encourage research to proceed from the practical learning (Schön, 1987). Artifacts
become embodiments of possible futures and designers can dynamically participate in
constructing the future.
The descriptions of the pedagogues as well as the attitudes of these children are used
during the field observations, allowing them to dynamically contribute to the artifacts’
development, to then use this knowledge to provide moments of emotional well-being to
them. Following, the research through design approach supports an evaluation that
guides to identify joy, amusement, gratification, or the lack of these positive emotions, as
well as additional annotations, which are significant for the emotional well-being
investigation.

**Activity Overview**
This section presents the method. The image below shows the timetable and structure of
the project activity providing an overall idea of the work in process during the collaboration
with the design research project.

![Figure 1: Method and timetable of the project activity, September 2012. Alexandra
Abalada.](image)

The study started with a literature review about the research design project as well as the
Snoezelen pedagogical practice. Subsequently, introductory meetings with the research
director of the project, as well as with the design researcher, the engineer researcher and
the industrial designer, were conducted. The meetings were valuable to obtain a deep
understanding about the research program, its values and how to support new forms of
interaction in the Snoezelen environment through tangible technology. After this period,
two guided visits to the Snoezelen space were organized to have a visual and a deep
understanding about the rooms’ environment. In addition to that, several meetings with
two Snoezelen pedagogues were carried to discuss some important issues, including
information about children with cognitive disabilities who spend time at the Snoezelen
rooms. Several videos with cognitively impaired children, interacting with previews
designs, were also presented and analyzed during these sessions. Additionally, it was
provided a visit to a school that works with children with sensory disabilities and supports
the design research project.
All the knowledge gained through field studies, theoretical readings, analyses of
inspirational and related designs, two mind maps, the first sketch experiments with physical and computational materials in the lab, supported to proceed with the first tangible design, the Octopus.

In December, it was presented in the real environment to children and pedagogues at the Snoezelen center. Therefore, the staff recorded the Octopus observation during one month and was reported in early January by video recordings. The video material was seen as a medium for reflection and to narrow down the investigation. The aim for the first design experiment was to obtain a critical view on how physical and computational materials were appropriated during the interplay between children and pedagogues in Snoezelen environment. Thus, the first prototype was part of the research through design approach, and has added a significant understanding in how to further explore the material investigation. It supported to realize that tactile sense allows cognitively impaired children to interact directly with the tangible world and a medium to evoke positive emotions (Sonneveld et al, 2008; Pagliano 2012; Hourcade et al, 2011).

The figure 2, shows an eight-year old boy interacting with the Octopus prototype, in a wheelchair, with the support of his pedagogue.

Figure 2: A-C presents an eight-year old boy interacting with the pedagogue and the Octopus prototype, January 2013. Alexandra Abalada.

After this stage, a mood board was made to outline a visual representation about the motivations through pictures and annotations. It supported to envision the atmosphere and values in a better scope, where children and pedagogues are immersed, to prepare for the ideation process.

In addition to the mood board, one mind map was done to outline the emotional well-being investigation through touch sense. The mind map, presented below, enabled to outline functional values in the tactile experience relating them to the emotional well-being assessment.

Figure 3: The Tactile mind map, January 2013. Alexandra Abalada.
All the knowledge gained from the research and practice, supported by the research through design approach, highly influenced the ideation for the subsequent design intervention. All the activities mentioned, supported to know in action, to narrow down and accomplish key design decisions, to then evaluate and proceed with the concept (Schön, 1987).

The following concept development stage had several iterations. The first tangible sketches were seen as the foundational piece in the discussions with researchers and Snoezelen pedagogues. All the experience of the pedagogues and the research team allowed to have a general perspective and comprised both sides; research and practice along the subsequent concept and prototype development. The annotated portfolio was seen as a compiling way of documenting the knowledge achieved through the exploration.

**Concept Generation: Designing Qualities in the Interaction**

The research through design approach supported to narrow down the emotional well-being investigation, defining the tactile sense as a medium to evoke positive emotions for the particular group of children that were observed with certain sorts of cognitive impairment such as; visual comprehension and memory disabilities. Following this stage, four key design decisions were outlined, from the knowledge achieved with the first tangible design (the Octopus), in order to support the qualities in the interaction for the following concept. Accordingly, the concept for the tactile and the material investigation should be: adaptable/malleable, it needs to have a quick and fast type of feedback, it also requires to have multimodal dimensions in order to let the child had a quicker perception, to foster curiosity and imagination through tactile. Consequently, eight qualities were defined.

<table>
<thead>
<tr>
<th>QUALITIES</th>
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<tr>
<td>Playability</td>
<td>to encourage a meaningful, rewarded = a positive experience</td>
</tr>
<tr>
<td>Responsability</td>
<td>To foster curiosity and imagination through an appropriate combination of physical and computational materials</td>
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<tr>
<td>Pliability/Malleability</td>
<td>It should be malleable in children’s hands</td>
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<tr>
<td>Understandability</td>
<td>To provide a quick and fast type of feedback in order to be understandable</td>
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<tr>
<td>Sensitivity</td>
<td>Soft textile materials should provide perceptive behaviors</td>
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<tr>
<td>Expressivity</td>
<td>Feedback reaction from the computational material or through the surface of the physical material</td>
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<tr>
<td>Multimodality</td>
<td>Different layers of physical materials to enrich the tactile experience through simple types of feedback</td>
</tr>
<tr>
<td>Versatility</td>
<td>It should be placed easily in any surface, be flexible according to child and pedagogue</td>
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Figure 4: The eight qualities for the following concept, January 2013. Alexandra Abalada.

During the ideation stage, physical materials with tactile properties were selected; cotton, felt, plastic surfaces for different layers, tulle as well as small size pieces of conductive fabric. Different types of haptic tactile feedback were also considered; tap, rap, stroking,
clutching, scratching and pressing. These tactile assets were connected to some of the qualities in the interaction presented above. In addition to that, it was confirmed the tactual properties of the materials (physical and computational) required to have a good balance between volume and weight distribution in order to let the prototype be malleable on children’s hands. Following, it was confirmed cotton and felt were safe physical materials. The concept evaluation was based on the knowledge achieved from the understanding of the previous stage. The final evaluation was conducted in a meeting with Snoezelen pedagogues, after presenting all of the four ideas in previous dialogues with pedagogues as well as with researchers of the design research programme.

Figure 5: The concept, February 2013. Alexandra Abalada.

Understandings concerning sound as a layer to support the tactile exploration were considered along this stage. According to Barrass, sound can be a source of additional information that engages the user and increases the tangibility and sense of presence in the haptic experience (Barrass et al., 2002). Other authors state the tactual properties of the artifacts enhanced by sound facilitates the cognitive development as well as various play skills such as joint attention as well as social interaction, in children with special needs (Hourcade et al, 2012; Pagliano, 2012). Accordingly research and practice, it was accomplished a sound layer should be distributed all over the artifact’s structure, in order to let the concept be fully understood by children. The sound layer attempts to guide the tactile exploration, allowing these children have a faster type of feedback. Thus, sound was seen as a layer to augment the act of touch.

**Sketching and Prototyping**

During this phase, two Arduino sketches were developed to discuss the presence of abstract sounds that supported the tactile capabilities of the physical material. Subsequently, a meeting with two Snoezelen pedagogues was carried. The purpose was to let the pedagogues envision the appropriate combination of possible layers of the physical materials and together construct possibilities that encourage the intended positive emotions.

Different types of abstract sounds were investigated in order to not influence pedagogues and children associating sounds already predefined to events and objects. The first sketch was composed by a piece of conductive fabric as the input, when touched by users, and a speaker as the output. The intention was to examine the type of sound generated by the speaker. The notes produced by the sketch were turbulent buzz sounds in addition to that the speaker had a low sound quality plus generated a narrow sound spectrum. Accordingly, the sound spectrum provided by the sketch was not presenting a strong connection to positive emotions, since it was not promoting feelings of happiness due to its buzz noises and the limited sound scope.
Subsequently, another sketch with Arduino uno was done with two pressure sensors, one flex sensor and a piezo, in a simple breadboard. All three sensors presented a broader sound scope comparing with the speaker. The intention was to observe how they worked together. The larger pressure sensor revealed to be the appropriate size for children and pedagogues’ fingers. The output were buzz and beep notes evoking a turbulent, confusing and chaotic atmosphere. Thus, it was not promoting a positive experience and not supporting the tactile exploration of the artifact.

An Arduino sound library was added in order to broad sound spectrum. This library, was supported by the music instrument shield (capable to generate thousands of different sounds) connected upon the Arduino uno. After testing the tone scale, it was verified the Arduino library had the intended broad sound scope. Therefore, the melodic tones provided by the library, were connected to the emotional well-being moments established at the beginning. This issue was presented and evaluated with design researchers of the design research programme. Following, the sketching stage guided to define the right way to merge both materials (physical and computational) into a hybrid tangible form.

During the prototype development stage, the tactile haptic feedback (tap, rap, stroking, clutching, scratching and pressing) was seen as a way to encourage tactile interactions.
The prototype was named during this stage as the Lively Friend. The time expressivity provided by the coupling between the physical with the computational reminded a lively form. Therefore, the name was influenced by the time expressivity. The act of touch to learn more about the artifact can be seen as part of the children’s perceptual process, encouraging them to construct meaningful interactions. The sequence of cause and effect events, during the interplay, fosters a sensorial involvement, leading to an embodied experience between users and the entity. As Svaenes states, both subjects can dialogue in a symbiotic relation (Svaenes, 2013). The word friend adds a pleasant quality to the intervention since is designed for and with cognitively impaired children. As Barrass states, embedded sonifications can be seen as mode of information in things (Barras et al., 2002). Therefore, sound attempted to foster curiosity and imagination. The abstract sounds were seen as a way of expression and functionality, encouraging perceptive behaviors; facilitating the cognitive development process as well as social interactions among children and the Snoezelen pedagogues.

Following, the three Snoezelen pedagogues agreed the physical materials were gentle for children’s hands, moreover each element on the surface had a connection to sound, creating a tactile soundscape. Additionally, they suggested a high quality speaker. Three design researchers also interplayed with the Lively Friend at the workspace lab. All agreed with the feedback provided from the Snoezelen pedagogues. Having a high-quality portable speaker would augment the sound potential while children and pedagogues explore haptics as a tactile feedback. Accordingly, it was decided to iterate the prototype with a high-quality portable speaker and the properties of the sound were amplified. Lately, it was confirmed the sound qualities were finally connected to the positive emotions initially stated. An additional meeting with two Snoezelen pedagogues was carried, following the prototype adjustments. The aim of this meeting was to present the Lively Friend prototype
before the observation with children, in order to envision how pedagogues would support the children during the interaction. In figure 10, shows one of the pedagogues during the meeting.

![Figure 10: One of the Snoezelen pedagogues interplaying and acting to be a child with visual and memory disabilities, April 2013. Alexandra Abalada.](image)

Subsequently, both pedagogues mentioned the four texture buttons on the prototype’s surface, supported by the abstract sound layer, encourage children to feel immersed in the tactile experience. Both pedagogues said the prototype works well for cognitively impaired children who have participated in the design programme.

**Observing the tangible design with Children**

As the children were introduced to the tangible design, it was seen how they interacted with the prototype in a variety of ways, during one week. Throughout the observations, it was considered the following demands: if the child felt encouraged to interact with the Lively Friend prototype, if the child felt interested to interplay with the pedagogue, if the interplay evoked joy and amusement, if the child felt anxious/stressed plus if the interaction was rewarded to the child.

The position in the observation was not to interfere while children and pedagogues interacted with the prototype in the Snoezelen context. Since it is a guideline established by the design research programme, this posture allowed the children to be in the most genuine Snoezelen atmosphere as possible. Video records were also conducted and it was seen as guidance for prospect work pointing to future design venues.

The next two examples show how the prototype was used in as well as the behaviors that were registered during the interaction with pedagogues.

In figure 11, shows an eight-year old boy interacting with the prototype with the support of the Snoezelen pedagogue. He is sitting in his wheelchair. In frame A, the prototype is introduced to him for the first time by his pedagogue. After the introduction phase, he looks and tries to stroke it with his fingers, in frame B, the pedagogue tries to approach it closer to the child, plus in frame C, he suddenly places the Lively Friend prototype around his neck, with the pedagogue’s support and continues to stroke its surface. The child felt very curious and stayed some minutes stroking, clutching, pressing and scratching the prototype’s surface and listening the sound very carefully.

![Figure 11: A-C presents the eight-year old boy with the Lively Friend Prototype in his wheelchair with the pedagogue, May 2013. Alexandra Abalada.](image)
The child laughed several times while he and the pedagogue were interacting with the Lively Friend. It was seen sound augmented the tactile experience of the child. He interacted during twelve minutes without any type of negative emotion identified in his conduct. The tactile experience made him feel involved for a stable period of time. Accordingly, it was registered moments of gratification. It was also observed feelings of joy and amusement during the interplay, while the child was smiling to the pedagogue. In figure 12, shows a twelve-year old boy interacting with the prototype with the support of his pedagogue. He placed the Lively Friend upon his legs and stroked one of the soft textures on the Lively Friend surface during some seconds. Meanwhile, he started to look to the entire prototype and began to rap and press during some seconds its surface. It was observed sound augmented the tactile experience of the child. He looked to the pedagogue smiling and enjoyed during five minutes. It was observed feelings of happiness; joy and amusement while the child was playing. The child did not feel uncomfortable and felt confident while was interacting with the prototype and his pedagogue.

Figure 12: A-B shows the twelve-year old boy interacting with the Lively Friend Prototype, May 2013. Alexandra Abalada.

Discussion
The aim of the investigation was to study how physical and computational materials could contribute for moments of emotional well-being for a particular group of children observed in the research project with certain sorts of cognitive impairment such as; visual comprehension and memory disabilities, with the pedagogues' support. The study began with a design space contextualization, in order to comprise understandings about the context, the cognitively impaired children and the role of the Snoezelen pedagogues. If theoretical studies, studies of the Snoezelen environment and analyses of related work were important components for knowledge construction, it was with the focus on designing the prototypes and study the effect of them in the actual environment, where a research through design approach really made a difference in my investigation. The research through design approach brought a number of benefits for cognitively impaired children, and it represented an attempt to achieve an inclusive approach to define appropriate emotional well-being moments to them such as joy, amusement and gratification. Moreover, it supported to gather relevant user information acquiring knowledge to create the intended emotional effects, to envision concepts that evoked the intended emotions.
It was accomplished a long-term involvement with children and pedagogues have facilitated design directions. Thus, it allowed children and pedagogues affect the ideation, allowing an open mind-set of potential ideas rather than fixed judgments, exploring and being critic along the study. According to Koskinen et al, the iteration between research and practice enriched the design research process and propitiated affective and rich interactions in tangible experiences (Koskinen et al, 2011). Thus, the knowledge was grounded according outcomes from readings, as well as from the iterations between pedagogues, children and designs. The descriptions of the pedagogues supported to sustain valuable considerations along the ideation and the concept development of the
tangible designs. They played a significant role in the investigation. Children had active participation, along the design process as well as intensely during the Octopus observation, supporting to narrow down the material investigation. Accordingly, the active role given to users, during the iterative process, assisted to identify positive emotions. In addition, the experiences from the design researchers also bring valuable annotations to predict which types of experiences should be avoided. Based on past interventions a constructive knowledge was carried to the emotional well-being exploration. Those meetings and the experiments with the computational and physical materials, conducted in the lab, were significant sustains to perceive important issues for the exploratory journey on emotional well-being and tactile investigation.

The Octopus prototype was a vital piece in the research through design process. Thus, the active children’s participation strongly influenced the investigation, contributing with valuable knowledge for the following concept in how to provide those moments of subjective well-being to them. New understandings were sustained about touch sense and affective behaviors. Consequently, the needs of children and pedagogues supported to accomplish understandings as well as to design qualities in the interaction of the following intervention (the Lively Friend prototype). Those qualities, in the interaction, materialized the tactile exploration, the empirical evaluation, the journey into the appropriate combination of the physical and the computational materials in order to evoke joy, amusement and gratification, increasing the self-esteem of the child.

During the Lively Friend observation, it was understood child and pedagogue enjoyed to interact with the prototype. This immersive experience was provided by the tactile haptic feedback. During the Lively Friend observations, it was registered the children felt confident while were interacting with the prototype with the support of the pedagogues. It was observed when children felt joy and amusement they smiled and looked directly to pedagogues in order to continue to play. The pedagogues confirmed this behavior and informed when they are tense, stressed or bored they simply don’t play. Thus, according to this information, it was not registered any type of negative emotion. After the Lively Friend observation, the Snoezelen pedagogues, who participated in the observation, confirmed the non-figurative sound layer reinforced the tactile exploration, encouraging the child to further explore the surface. The haptic tactile feedback encouraged perceptive behaviors, evoking feelings of joy, amusement and gratification for great amount of time. According to that, they confirmed it was a meaningful thus, a rewarded experience to the children.

Concluding, all the fundamental knowledge provided from iterations, between the research in the lab and the Snoezelen context in the field, would not be possible to achieve only with theory and literature readings. In this study, research required practice. According to Schön, my interventions were supported by the quality of knowing in action (Schön, 1987). The main contribution to the field focused on how to make good design, supported by the research through design approach.

In addition to that, an annotated portfolio was considered in digital support. It can be seen as the exhibition, presenting part of the dissemination of knowledge that was obtained along the tactile and the material exploration. Concepts and prototypes are complemented through annotations as the annotations indicate the concept exploration through these designs. As Bowers states, one cannot fully understand as a single item (Bowers, 2012). Thus, it is a tangible way of documenting part of my research through design approach through annotations and visual images and illustrations and it stays between the designs and the general background theory from the investigation (Lowgren, 2013).

This paper, can also be viewed as an attempt to encourage the design community to consider the emotional well-being topic that has gaining a steady interest and gaining highlight since the last decade (Desmet, 2009). Consequently, it can be viewed as a way to discuss opportunities about its assessment in inclusive design as well as interactions that evoke positive emotions and contribute to the quality of life in disabled users of our Society.
Conclusion

With this paper, the main objective was to present how the research through design approach contributed to drive the exploration on design for emotional well-being in a specific context. I presented and observed the design process and considerations to then present the contribution this paper attempts to present for the design community. If the project would have two years of investigation I would consider different contexts. Although I believe I deeply investigated the issue, in the context I was committed and obtained reliable answers to my research question during the activity time of the project supported by the research through design approach. I hope this paper may attempt to encourage the design community to consider the emotional well-being topic, in the design process in inclusive design as well as out of this context, and to reflect the impact in individuals and communities.

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Alexandra is an Interaction designer with a background in communication, fashion design and visual culture. She believes interaction design can guide technology to encourage, and strengthen the users’ abilities and well-being (always with a User-Centered Design approach) considering their physical, cognitive and emotional aspects.

During her design practice Alexandra has been exploring service design, user experience design, hybrid wearable technology, embodied interaction, visual design and design research.

After working during 5 years in Lisbon in visual and communication design, Alexandra moved to Scandinavia to explore Interaction Design areas in design research projects for such companies as Novo Nordisk, Danfoss, GN Netcom, Bang & Olufsen and many others. She has a deep interest in Healthcare and Well-being domains. DIY communities are also a topic of her interest.

She holds a MSc degree in Interaction Design, a previous MA in Visual Culture, a BA in Communication Design with earlier studies in fashion design and arts.