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Understanding the Empathy in the Design Thinking Process

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Abstract*: Empathy has been referred to as one of the main aspects and the key impact factor of Design Thinking (DT). The DT process allows the outcome to be a technically viable solution, while being a desirable output for the users (consumers of the products) and an economically feasible project. The production in the DT process starts with the user's desirability to reach pleasurable and better products. A common approach to gain a desirable output is having empathy with the users. The empathy implies understanding the individual's desires (their functional and supra-functional needs). Several techniques have been identified for uncovering the users' needs and reaching the maximum empathy; albeit it is not achieved straightforwardly. There are lots of products and services in life that are not as delightful, enjoyable and pleasurable as it should be for the end users. The big concern in this context, yet, is to identify the gap in understanding the users' needs in the empathy approach. In line with this, the present research is an endeavor to identify the issues associated with empathy in the DT process and to recognize the obstacles for deep and real empathy with the end user. This paper majorly revolves around reviewing the Empathy and the DT. Findings acknowledge that misunderstanding is a common phenomenon in the Empathy approach in the DT process and the leading cause for this misunderstanding is attributed to the users' supra-functional needs. Indeed, it is underscored hereby that misunderstanding the empathy might result in unpleasant senses among the users, as well as leading to producers' unplanned charges, suggesting that the designers would be urged to minimize misunderstanding in the empathy approach.

***Keywords* :Design Thinking, Empathy approach, Misunderstanding, Supra-functional needs.**

I. INTRODUCTION

The most common approach in the Design Thinking (DT) process to understand users' need and gain insight about them is Empathy (Brown, 2009a). The DT is a user-centred approach where the user'sneeds, performs, and favourites are as its heart.

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The generation in the DT worldview does not begin until the concealed desires and needs of users are inspected (Meinel&Leifer, 2012). Hidden needs are ordinarily emotional ones being difficult to express and understand.

Designers should focus on Empathy with the people they are designing for to gain a desirable output in the DT process. The empathy is crucial to constructing momentous products (Kolko, 2014) because empathic understanding can fill the gap between the creator and the emotional desires of the end-user (McDonagh, 2015; Meinel&Leifer, 2012).

It is highly daunting to spot a need and design a response and subsequently it is tough to produce a valuable product that someone really loves (Kolko, 2014). Users' need can be divided into functional and supra-functional (emotional) needs. Designers should focus on refining their capability of understanding and extracting the emotions and feelings of the end-users (Dandavate, Sanders, & Stuart, 1996).

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II. METHODOLOGY

This paper has used the literature review from journals and books through extraction of the important keywords that are related to design thinking, empathy, user's misunderstanding and user's supra-functional needs. The contextual analysis related to the important keywords has been done to identify the empathy gap in the design thinking process to design a new product.

III. DESIGN THINKING AND EMPATHY

The DT is recognised as an exciting approach for coping with problems in various disciplinaries and it is approved that the DT may result in the best potential answer (Brown,2009a). What really happens in design thinking is 'intuition' (Cross, 2011). The basis of the DT lies at the crossing point of technical feasibility, economic viability, and desirability by the user (Brown, 2009a). Balancing in desirability of what humans need with technical feasibility and economic viability is very essential in the DT (Brown, 2009b).The DT process is a collaborative and participative tactic for tackling the problems and human desirability is the most vital part of this process (Brown, 2009a) which can deliver a meaningful value to innovation and management (Hassi&Laakso, 2011).

The DT process has five stages: Empathize, Define, Ideate, Prototype, and Test. ("Interaction Design Foundation | What is Design Thinking?," 2019). The Empathize or Discovery stage is to know about users, especially about their hidden and latent needs (needs that might be intense, albeit individuals will most likely be unable to express them) (Brown, 2009a).

Traditional methods such as using a marketer and retailer reports are not appropriate as a tool for empathy-building and cannot help designers to reach deep empathy. These methods will never prompt standard breaking, diversion evolving, and game changing (Brown, 2009a). They cannot help a designer to increase deep empathy and they are insufficient as a tool for empathy-building (Crossley, 2003). Market researchers rely on emotional needs, but mostly emotions surrounding the buying of the goods (Dandavate et al., 1996) not the emotions related to the use and desirability. On the other hand, knowing user's feelings and behaviours is imperative because immaterial things are worth maybe more than material things (Brown, 2009b); on the contrary, market research pays more attention to material things.

How can designers cope with the challenge of understanding the users' latent needs, especially their emotional needs? There are three mutually reinforcing elements of any successful design programs, known as the insight, observation, and empathy (Brown, 2009a). Observation is one of the empathy methods while insight is empathy's result. In the design profession, an insight is a challenging declaration of the fact about a person's behaviour (Kolko, 2014).

The most well-known way to deal with the insight is the Empathy. Design philosophers as well as design experts define the empathy as a key impact factor of the DT (Meinel&Leifer, 2012). Empathy has been found in the diverse disciplines while having different definitions but the discipline most qualified with the design is the psychology and indeed the cause of emotional features of a product is deep-rooted in psychology (Dandavate et al., 1996). The Empathy in the psychology is characterized as comprehending and reproducing the perspective (experience, feelings and thoughts) of others (Devecchi& Guerrini, 2017).

The Empathy in the design typically means an excellent and creative understanding of the users' needs and experiences for new product development (NPD) (Kouprie et al., 2009; McDonagh& Thomas, 2010; Postma, Zwartkruis-Pelgrim, Daemen, & Du, 2012). The Empathy emerges when the designer starts to consider a more user-cantered style when developing the products (Devecchi& Guerrini, 2017) and the Empathy can act as a link between people and needs (Meinel&Leifer, 2012). McDonagh (2006) defines the empathy as "the intuitive ability to identify other people's thoughts and feelings – their motivations, emotional and mental models, values, priorities, preferences, and inner conflicts" (Kouprie et al., 2009).

The Empathy in the design can be divided into two forms: internal and external empathy (Meinel&Leifer, 2012). The internal empathy is linked to the empathy in the design teamwork that is not the scope of this study. On the other hand, the external empathy refers to the user's empathy. The external empathy can be considered in two ways. Firstly, it can be used as a tool to design with. Secondly, it can be considered as a way to get an insight into the users' needs (Gasparini, 2015). In the Empathy, first the user's desires are investigated; then one thinks about the technical or economic feasibility (Meinel&Leifer, 2012).

It is of note that the empathy plays a pivotal role in the first step of the DT process, when the product needs to be recognised and the product concepts have to be developed (Postma et al., 2012; Takahashi, Oki, Bourreau, Kitahara, & Suzuki, 2018) because designers know that the design is less about the last product and more about the user experience (McDonagh& Thomas, 2010). Meanwhile, the experience design means the design directed by general and comprehensive understanding of the users and their experiences(Crossley, 2003; Postma et al., 2012). This experience must be perceived, documented, and interpreted to get a form of implicit knowledge from the user experiences (Meinel&Leifer, 2012).

In the empathy approach, the user is considered as a partner. This consideration happens in the very primary step of the DT process (Design Brief) (McDonagh& Thomas, 2010). In the empathic design policy, the users are recognised as being major foundations of both the insight and innovation (McDonagh& Thomas, 2010).

To sum up, the empathy approach can help the Design Thinker to realize the user's needs (the ones he or she may not be conscious of) through gaining an insight about their lives and experiences in order to raise the probability that the product meets the user's needs. (Kouprie et al., 2009; Meinel&Leifer, 2012). Description of the empathy in the DT profession has been exhibited in Fig.1.

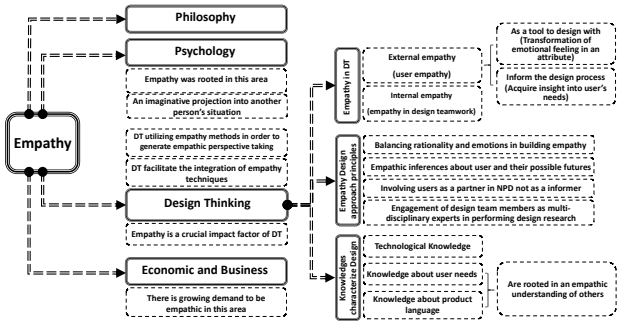

Fig. 1.the DT among the other disciplines related to the Empathy

IV. COMPONENTS OF THE EMPATHY

Two components of the empathy are affective and cognitive (Kouprie et al., 2009). The affective component means the ability to reply with a proper emotion to another individual's psychological mood (Devecchi& Guerrini, 2017) which is in effect an instant and involuntary emotional reply of the empathiser to the emotional mood of the empathee(Kouprie et al., 2009). The affective empathy is split into Empathic Concern and Personal Distress (Devecchi& Guerrini, 2017). On the other hand, the cognitive component implies the capacity to distinguish and recognize another person's viewpoint or psychological mood (Devecchi& Guerrini, 2017)

and experience the world from their perspective (Gasparini, 2015). The cognitive empathy is split into perspective-taking and Fantasy (Devecchi& Guerrini, 2017).

Creative understanding of both sections and generating the correct balance between them is crucial for the designers because of the fact that the affective and cognitive components are interconnected (Kolko, 2014; Kouprie et al., 2009; Postma et al., 2012).

In the Empathic Design, definition of the empathy is close to the Cognitive Empathy, especially to the Perspective-Taking scale. Perspective-Taking is the capacity to assume the others' viewpoints and to visualize his/her emotions, feelings, and thoughts (Devecchi& Guerrini, 2017). Kouprie&SleeswijkVisser (2009) pinpointed that "designers should gain understanding of the user (cognitive) by feeling the user's emotional state (affective)". Empathy components have been illustrated in Fig. 2.

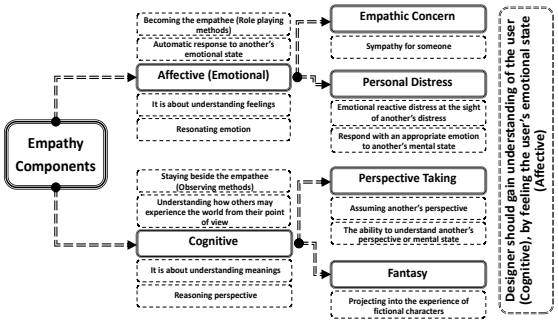

Fig. 2.The two main components of the Empathy

V. BUILDING THE EMPATHY

Building the empathy with end users is the basis of the design process (Takahashi et al., 2018). Steps for building the empathy in the design practice are rooted in the psychological literature and consist of: (1) discovery, (2) immersion and connection, (3) detachment, and (4) Interpret and Intuit (Figure 3) (Kouprie et al., 2009).

The most paramount stage in building the empathy is immersion. By 'immersing' and 'internalizing', the designers become users and they unite with the users (Crossley, 2003; Kouprie et al., 2009). Immersing includes several techniques such as participation and observation (Crossley, 2003). There are varieties of Empathy techniques for the immersing stage. The steps for building the empathy in the design have been illustrated in Fig.3.

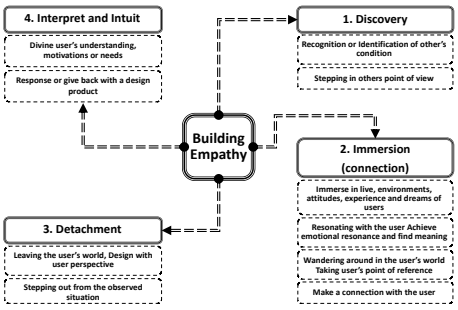

Fig. 3.Empathy building steps

VI. EMPATHIC METHODS AND TECHNIQUES

Kouprie and SleeswijkVisser (2009) have divided empathy techniques into three main classes: techniques for a direct contact between the designers and the users (use in research stage in DT), techniques for communicating the findings related to the user studies to the design teams (communication), and techniques for evoking the designer's own experiences in a domain relevant to the user (use in ideation stage in DT). These techniques in the DT process are a combination of emotional and cognitive aspects (Meinel&Leifer, 2012).

Research techniques usually used in the External Empathy have three categories. A: this category consists of the techniques related to what people do in their own context, and it mainly involves observational techniques. B: this consists of the techniques related to asking people to contribute by expressing their thoughts, dreams and feelings (Interview). C: this involves the techniques related to trying things by designers and learning about user's experiences (Simulation) (Meinel&Leifer, 2012; Postma et al., 2012). If traditional techniques were considered we would have: Direct techniques (Observation, Interview), Indirect techniques (storytelling techniques), and simulation techniques (Role-playing techniques).

Direct techniques: Direct contact with end users is widely highlighted by the experts (Kouprie et al., 2009). Observation is the main segment of this technique because translation of the observations into insights and insights into products is the DT duty (Brown, 2009a). This Observation should be done with actual persons in the real-life condition to realize what their problems are (Kelley, 2001).

One of the focal aspects of observation is Observing the Behaviour (Brown, 2009a). The focus of the user understanding is on behavioural and experiential features in place of user characteristics (Kouprie et al., 2009) and observing the natural behaviour is significant to gain a whole image of how persons experience things (Crossley, 2003). Tim Brown underlines that the user's behaviours are never correct or incorrect, but they are always significant.

There is a proper technique for the experimental empathy with the user that is called Ethnography. The ethnography is concerned with the user's perspective and experience(Wright & McCarthy, 2008). Meanwhile, ethnographic shadowing (seeing users in their real context) is one of the empathic techniques (McDonagh& Thomas, 2010).

Interviewing is another major part of the Direct Empathy. Understanding the user in the user research often involves a dialogue with them (Wright & McCarthy, 2008). Personalised interviews can be a fruitful approach to join with actual people and gain insights (Mortensen, 2019) because entering into their meaning system can be achieved by listening to users experience (Crossley, 2003).

Indirect techniques: communication techniques are typically used when a direct contact is not possible. External researchers commonly apply this techniques to handle the user study, and convey the user findings to the design team (Kouprie et al., 2009).

To extract user experience, they often apply storytelling techniques such as personas, scenarios, storyboards, and role-playing(Kouprie et al., 2009).

Indirect observation can be undertaken by using the technologies like cameras. In user camera-based studies, users are photographed or filmed (Mortensen, 2019). In the Personal Photo and Video Journals method, the user makes a film under the instructions given to him.

Simulation techniques: simulating the user's situation helps the designers to enter to the user's experience. To achieve this goal, a variety of role-playing (imitating the user's life) techniques exist such as: 'product handling', 'experience prototyping', 'bodystorming' and 'informance' (Kouprie et al., 2009), 'Bodystorm' (experiencing a situation physically (Meinel&Leifer, 2012)), 'Experience prototypes' (simulating an experience with a product (Kouprie et al., 2009; Wright & McCarthy, 2008)), 'Empathic modelling' (living a day in the life of someone else (McDonagh, 2015)).

In general, these techniques for collecting the empathy data are eclectic and grow with each scheme and situation (Crossley, 2003). There is not a rigid empathy method as they are built upon the designers current skills (McDonagh-Philp &Lebbon, 2000). In these methods, the insights are collected from the behaviours, actions, spoken feelings, thoughts and dreams. The Focus in these techniques is mostly on the users' behaviours (like ethnography) and actions (like bodystorm) and less on capturing the users' thoughts and emotions. The Empathy main techniques have been depicted in Fig. 4.

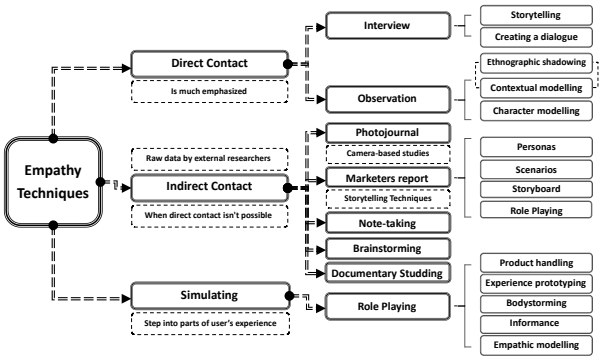

Fig. 4.Empathy Techniques

VII. DISCUSSION

The literature review related to the DT and Empathy approach asserts that for reaching a pleasurable product, we should gain insight concerning the end-user and the Empathy approach is the best choice to achieve such a goal. In the empathy building process, there are various methods to immerse in the user's life in order to extract their needs. Nonetheless, in practice, we suffer from dearth of impactful, enjoyable and pleasurable products in our daily life. By reviewing the impact factors of the Empathy, the gap in this approach can be distinguished. Some of the main impact factors of the Empathy approach are explained as follows:

Time: Time demands have a bad effect on the whole design process (McDonagh, 2015) because the Empathy in the design practice needs a planned investment of time. The Empathy is not an immediate feature, but grows in a procedure over time (Kouprie et al., 2009). Designers should spend time with users and experience their gladness and sadness to understand them (Kolko, 2014).

Designers' ability: or Empathic horizon is one of the main Empathy specifications. The 'empathic horizon' (McDonagh-Philp and Denton 1999) refers to the designer's individual ability limitation to empathise with a certain user group, such as background, nationality, culture, age, gender, experience, and education (Kouprie et al., 2009).

Designers' willingness: willingness of the designer exerts a significant impact on the empathy (Kouprie et al., 2009). Designer's willingness consists of his own connection with the user that inspires him (particular attention into the user group), his emotional mood that hinders him and his commitment to the project (how much the designer is responsible for the project) (Kouprie et al., 2009).

User's expression ability: Designer cannot rely on users' oral expression about their needs even their practical needs because the users do not always express all the points. They may not reveal information out of fear, distrust or some other hindering factors (Dam & Siang, 2018). Maybe, the main problem in expressing the needs is that the users are adapting to inconvenient situations so easily that they are often not even aware of their needs (Brown, 2009a).

Secondary data: Designers should not rely on the secondary data alone (such as market research, socio-economic and anthropometric) to produce their own principal information about the users (reasons have been mentioned in the DT and Empathy section) (McDonagh, 2015). However, most of the projects employ the secondary data for gaining empathy with their end user.

Supra-functional needs: Users pursue more than functionality alone. Users have complex supra-functional needs such as feelings, emotions, dreams and aspirations (McDonagh& Thomas, 2010) and these kinds of needs are completely emotional. Expressing and understanding the thoughts are difficult, especially the emotional needs because feelings are private and complex (Kolko, 2014) and thoughts/beliefs and feelings/emotions cannot be perceived straight. They must be deduced by paying a thorough attention to diverse clues (Meinel&Leifer, 2012).

As Fig.5 demonstrates, if the impact factors of the Empathy are not considered properly, it will result in misunderstanding or unreal understanding. Misunderstanding is a common phenomenon in the Empathy approach in practice. Unfortunately, in most projects, time is too limited, and the users are not able or tend to express their needs properly (especially supra-functional needs), the users' needs are rarely the designer's needs (designer's personal insight), and projects use the secondary data for empathy. The last and more effective reason for misunderstanding is unsuitable tools or methods to extract users experience and hidden needs. Misunderstanding the user's perspective leads to misunderstanding the user's pleasure, finally resulting in misunderstanding in the user's product decision making. In other words, unreal empathy leads to unpleasable products and user's dissatisfaction.

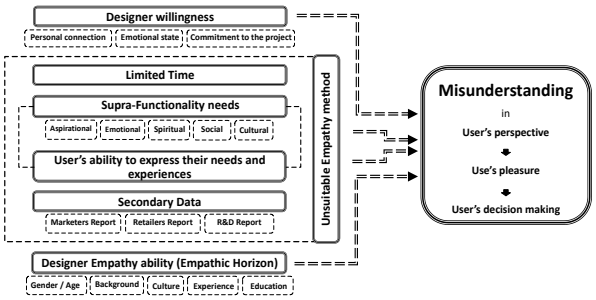

Fig. 5.Misunderstanding components in the Empathy

VIII. CONCLUSION

The empathy in the DT focuses on the user perspective taking by considering the user's behaviour and experience in order to gain insight into the users' needs. Two main empathy principles are balancing rationality and emotions and involving users as partners. The empathy is an innate feature and can be taught and learned. In the DT process, empathy's conscious and controllable component (cognitive) is more important. Immersing as the most important stage in building the empathy involves techniques for gathering the empathy information. There are various empathy methods that are eclectic and change with each project and situation. In the empathic design, people's feelings and experiences are thought to be best understood through empathy (Postma et al., 2012) but since a user's experience is not actually experienced by a designer, it may lead to misunderstandings and subjectivity (Gasparini, 2015). Among the misunderstanding reasons (Fig.5), two reasons that are related to the designer (the designer's willingness and the designer's empathy ability) can be enhanced by practice and experience. Reasons such as Time and Secondary data can be covered easily by an appropriate empathy method. Nevertheless, supra-functionality needs play a key role in making empathy misunderstanding. Supra-functionality need is a mutual reason which is related to the user's ability to express themselves on the one hand and the designer's ability to understand them on the other hand. By extracting the user's supra-functionality needs, there will be certainly a diminishment in the misunderstanding while deep and real empathy will be achieved consequently. Whereas the empathy in organizations is the creator of wisdom and knowledge, misunderstandings it might result in unplanned charges (Meinel&Leifer, 2012). As such, the designers have to minimize empathy misunderstanding by constructing an alternative empathy method whose focus is on eliciting the user's supra-functionality needs.

REFERENCES

1. Brown, T. (2009a). Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation (1th ed.). HarperCollins. Available:https://doi.org/10.1017/CBO9781107415324.004
2. Brown, T. (2009b). Tim Brown: Designers -- think big! | TED Talk. Retrieved April 23, 2019, Available: https://www.ted.com/talks/tim_brown_urges_designers_to_think_big
3. Cross, N. (2011). Design thinking: Understanding how designers think and work. Berg.
4. Crossley, L. (2003). Building Emotions in Design. The Design Journal, 6(3), 35–45. Available:https://doi.org/10.2752/146069203789355264
5. Dam, R., & Siang, T. (2018). Design Thinking: Getting Started with Empathy | Interaction Design Foundation. Retrieved March 22, 2019, Available:https://www.interaction-design.org/literature/article/design-thinking-getting-started-with-empathy
6. Dandavate, U., Sanders, E. B.-N., & Stuart, S. (1996). Emotions Matter: User Empathy in the Product Development Process. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 40(7), 415–418.Available: https://doi.org/10.1177/1078390311434260
7. Devecchi, A., & Guerrini, L. (2017). Empathy and Design. A new perspective. The Design Journal, 20(sup1), S4357–S4364. Available:https://doi.org/10.1080/14606925.2017.1352932
8. Gasparini, A. (2015). Perspective and use of empathy in design thinking. ACHI, The Eight International Conference on Advances in Computer-Human Interactions, 49–54.
9. Hassi, L., &Laakso, M. (2011). Design Thinking in the Management Discourse: Defining the Elements of the Concept. 18th IPDM Conference, 1–14.
10. Interaction Design Foundation | What is Design Thinking? (2019). Retrieved March 22, 2019, Available: https://www.interaction-design.org/literature/topics/design-thinking?page=3
11. Kelley, T. O. M. A. (2001). The art of innovation: Lessons in creativity from IDEO, America's leading design firm (Vol. 10). Broadway Business.
12. Kolko, J. (2014). Well-designed : how to use empathy to create products people love. Well Designed. Massachusetts: Harvard Business Review press.
13. Kouprie, M., Visser, F. S., &SleeswijkVisser, F. (2009). A framework for empathy in design: Stepping into and out of the user's life. Journal of Engineering Design, 20(5), 437–448. Available:https://doi.org/10.1080/09544820902875033
14. McDonagh-Philp, D., &Lebbon, C. (2000). The Emotional Domain in Product Design. The Design Journal, 3(1), 31–43. Available:https://doi.org/10.2752/146069200789393562
15. McDonagh, D. (2015). Design students foreseeing the unforeseeable: Practicebased empathic research methods. International Journal of Education Through Art, 11(3), 421–431. Available:https://doi.org/10.1386/eta.11.3.421_1
16. McDonagh, D., & Thomas, J. (2010). Disability + relevant design: Empathic design strategies supporting more effective new product design outcomes. Design Journal, 13(2), 180–196. Available:https://doi.org/10.2752/175470710X12735884220899
17. Meinel, C., &Leifer, L. (2012). Empathy via Design Thinking: Creation of Sense and Knowledge. In Design Thinking Research (pp. 1–11). Berlin, Heidelberg: Springer Berlin Heidelberg.Available: https://doi.org/10.1007/978-3-642-21643-5_1
18. Mortensen, D. (2019). Stage 1 in the Design Thinking Process: Empathise with Your Users | Interaction Design Foundation. Retrieved March 22, 2019, Available: https://www.interaction-design.org/literature/article/stage-1-in-the-design-thinking-process-empathise-with-your-users
19. Postma, C. E., Zwartkruis-Pelgrim, E., Daemen, E., & Du, J. (2012). Challenges of doing empathic design: Experiences from industry. International Journal of Design, 6(1).
20. Takahashi, I., Oki, M., Bourreau, B., Kitahara, I., & Suzuki, K. (2018). An Empathic Design Approach to an Augmented Gymnasium in a Special Needs School Setting, 12(3), 111–125.
21. Weightman, D., &McDonagh, D. (2004). Supra-functional factors in sustainable products. Design and Manufacture for Sustainable Development, 91–101.
22. Wright, P., & McCarthy, J. (2008). Empathy and experience in HCI. Proceeding of the Twenty-Sixth Annual CHI Conference on Human Factors in Computing Systems - CHI '08, 637.Available: https://doi.org/10.1145/1357054.1357156

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