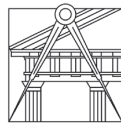


January 2017

**Dissertation for obtaining the degree of Master in Product Design**



**Affective Design and the Pre-adolescent Child**  
The case of User-Centered Design & Portuguese Basketry



**FACULDADE DE ARQUITETURA**  
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**Master's degree student: Rafaela Mogas**

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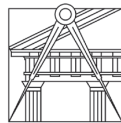
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# Abstract

Products are able to make us connect to our country's identity through their rich history and meaning. As such, we find it of high importance to pass such a notion to younger generations that are at the age of understanding such a concept and that we believe aren't being properly instructed. Therefore we find key to help pre-adolescents connect with a craftsmanship like basketry as a way to help them understand and value its importance. This experience is ultimately based on the idea of practical knowledge and as such its premise is engage by doing.

By leading a researched based on a mixed methodology that comprised both qualitative interventionist and non interventionists methods we were able to prove the value of using an approach that stemmed from the principles of User-centered Design adapted to children's particular needs in a Product Design project.

Based on a theoretical approach that studied Affective Design, Portuguese Identity and User-centered Design and the pre adolescent child we were able to effectively understand every topic at play in achieving the scope of this research. This not only helped us build a strong background knowledge but also get us to be comfortable enough with topics to actually implement the found research in a real scenario by involving the user's up until and including the project development stage.

With this in mind, we were able to in a first moment develop a full preliminary study that encompassed a questionnaire delivered to a large sample group and the planning of two generative sessions held with a smaller sample group. This steps allowed us to get a better sense of the user's needs as well as it helped us connect to their standpoint, which ultimately allowed us to achieve a list of requirements that the product would fulfill. As such, this product consisted in a DIY wicker kit for children aged 9 to 12 and meant for them to experience basketry in first hand and therefore understand and be curious about this craftsmanship as well as the meaning behind it. This product was subject of a validation stage where a usability test took place.

It is our belief that by the end of this research we were able to create a fun, useful and mindful object that meets the needs of the users by enabling them to experience unfamiliar territory through the experimentation of a new material and learning about its ties to craftsmanship and Portuguese identity. By doing so, this object contributes to the dissemination of the importance of craftsmanship in younger generations which ultimately perpetuates the idea of understanding our country's traditions and the meaning that products can hold.

## **Key words:**

Product Design, Affective Design, Portuguese identity, User-Centered Design and Pre-adolescent Child





# Resumo

Os produtos são passíveis de, através da sua rica história e significado, conter dentro deles a capacidade de fazer-nos conectar com a identidade do nosso país. Como tal, achamos de grande importância passar essa noção para as gerações mais jovens que já se encontram numa idade em que são capazes de entender esse conceito e que acreditamos que não estão a ser devidamente instruídas. Como tal, achamos que a chave reside em ajudar pré-adolescentes a conectarem-se com uma forma de artesanato, como a cestaria, como forma de ajudá-los a compreender e valorizar a sua importância. Esta experiência tem como base a ideia de conhecimento prático e, como tal, a sua premissa é conectar ao fazer.

Ao levar a cabo uma pesquisa com base numa metodologia mista que compreendia tanto métodos qualitativos intervencionistas e não intervencionistas fomos capazes de provar o valor que reside em usar uma abordagem que resulta de princípios de Design Centrado no utilizador, adaptadas às necessidades específicas das crianças, num projeto de Design de Produto.

Com base numa abordagem teórica que se focou no Design Afetivo, Identidade Portuguesa, Design Centrado no Utilizador e na criança pré-adolescente fomos capazes de compreender de forma eficaz todos os temas envolvidos nesta pesquisa. Isto não só nos ajudou a construir uma forte base de conhecimentos, mas também nos tornou à vontade o suficiente com os temas para implementar a pesquisa encontrada num cenário real, permitindo envolver o utilizador da pré-fase à fase de desenvolvimento do projeto.

Consequentemente, fomos capazes de num primeiro momento desenvolver um estudo preliminar completo que abrangeu um questionário entregue a um grande grupo de amostra e o planeamento de duas sessões generativas realizadas com uma amostra menor. Estes passos permitiram-nos ter uma melhor noção das necessidades do utilizador, assim como nos ajudar a conectar com o seu ponto de vista, o que em última análise permitiu-nos alcançar uma lista de requisitos que o produto deveria cumprir. Como tal, este produto, culminou num kit de vime DIY (T.L: *Faz tu mesmo*) para crianças de 9 a 12 de idade e que as permite experimentar em primeira mão o vime e a cestaria e, portanto, compreender e fomentar a curiosidade pelo artesanato, bem como o significado por trás dele. Este produto foi objecto de uma etapa de validação, onde um teste de usabilidade ocorreu.

É nossa convicção que no final desta pesquisa, fomos capazes de criar um produto divertido, útil e consciente que atende às necessidades dos utilizadores. Este permite-lhes explorar território desconhecido ao experimentar um novo material e estimulando a vontade de aprender sobre os laços que o material tem com o artesanato e a identidade Portuguesa. Ao fazê-lo, este objeto contribui para a disseminação da importância do artesanato nas gerações mais jovens, o que acaba por perpetuar a ideia de que é importante compreender as tradições do nosso país e o significado que os produtos podem conter.

## **Palavras-chave:**

Design de Produto, Design Afetivo, Identidade Portuguesa, Design Centrado no Utilizador e Pré-Adolescente



# Glossary

**A**ffect - Moderator of emotions and feelings

**C**hild-centered Design - Design process based on user experience and adapted to children's particular needs

**C**onspicuous consumption - Acquiring luxury goods and services to publicly display economic power

**G**lobalisation - The process of international integration

**P**lanned obsolescence - Planning or designing a product with an artificially limited useful life

**P**re adolescent - Child aged 9 to 12

**U**ser-centered design - Design process based on user experience



# Acronyms and abbreviations

**DIY** - Do It Yourself



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Part I

# Introduction

**Introduction**

**Problematic**

**Research questions**

**Goals**

General

Specific

**Brief Methodological Note**





# Introduction

Objects apart from being able to satisfy a want or need are capable of holding memories and meaning. In this dimension of a product we find craftsmanship as an unequivocal example of a product that represents more than the fulfillment of a simple task. We find a product capable of establishing a direct bridge between the past and present. The importance of transmitting such values is undeniable. Through their preservation we are able to stay connected to our ancestors and our own history. More than anything this type of objects are able to establish an identity and a sense of belonging that ultimately constitutes our heritage. Portugal, is a country with an extensively rich culture, though small, each corner of the country hides a deep sense of tradition and culture. It is in this sense that we find basketry, a form of craftsmanship deeply rooted into our countries history. In its millennial history we find the artifacts that establish our own mores that stand to this day. With such a rich history we can't afford to let such a tradition dwindle away. As such, it must be preserved at all cost otherwise we'll be risking losing part of our own identity.

The fact that this type of craftsmanship needs to be preserved stands more dire today as the rapid advances of technology dictate the origin of such phenomenons as globalisation<sup>1</sup>, conspicuous consumption<sup>2</sup> and planned obsolescence<sup>3</sup> the combining of such phenomenons results in an entire new generation being brought up into a society that seems to have forgotten the meaning of tradition and folklore and no longer value it. As such, an opportunity to help the younger generation connect with an older one becomes a strategy able to reverse the current trends seen as prejudicial. Thus, finding pre adolescents<sup>4</sup> a group of interest as they are within an age range capable of building their own sense of what is right and wrong in the world which makes them eager to learn new things in order to assess their value.

This research is developed within the Product Design field where Affective Design is explored in a User-centered design approach where

---

1 Globalisation is the process of international integration arising from the interchange of world views, products, ideas and other aspects of culture

2 Conspicuous consumption is the spending of money on and the acquiring of luxury goods and services to publicly display economic power

3 Planned obsolescence in industrial design and economics is a policy of planning or designing a product with an artificially limited useful life, so it will become obsolete after a certain period of time

4 Children aged 9 to 12



participatory methods were exploited in order to help avail the researcher with a clear idea of how the targeted group perceives craftsmanship and basketry. This resulted in a research that fundamentally fell back on the user's perceptions and needs to achieve a product capable of solving the problem found.

The proposed solution is the result of a research that intended to develop a product capable of stimulating younger generations to learn about their country's culture and therefore understand the affective value that an object can hold, understanding its meaning and importance. To achieve this, research methods were used to determine the day-to-day life, tastes and habits of a preadolescent child and a more holistic approach was used to determine their already existing knowledge on the topics, level of interest and understand their perception of the current state of their generation in terms of interests in things other than technology related. The methods employed intended to gather valuable information to determine what requirements the product had to check in order to produce a solution that met the user's needs regarding the topics.

The following dissertation documents every step of this research, starting with the data collection, analysis, consequent project development and evaluation of the designed solution that allowed the optimization of the prototype.



# Problematic

Products are able to establish a connection between past and present. Therefore, the preservation of objects holding such meaning is essential to carry out our values and history through generations.

Portuguese craftsmanship is an example of that effect, as a product resulting from craftsmanship inherently provides the user with a piece of a country's history and culture that no other object can possess. In this sense, craftsmanship products become of vital importance in a society that seems to have grown careless and forgetful of the meaning an object can hold at the expense of jeopardizing the existence of elements that build our country's identity. This type of mindset becomes worrying when we consider what behavioural examples the younger generations are being given. As such, we recognise that there is a lack of products aimed at instructing kids to appreciate and value our country's tradition and craftsmanship. In order to avail future generations with the understanding that such craftsmanship products are a part of our country's identity and therefore important to understand and preserve. With that in mind, pre adolescents seem to hold the required set of cognitive skills to grasp the intricacy of the values that this research intends to provide the user with. Consequently, the targeted group of this research are preadolescents willing to learn and experience a form of craftsmanship to build their own knowledge over the importance of preserving the country's identity.

To design for a user we must first understand him. Subsequently User-centered design methodologies become a powerful asset to do so. However, they become limited in range when they fail to understand the different needs of each target group as not all users hold the same cognitive abilities or level of development. Considering this scenario children appear as an intricate and delicate target group as they're still developing their skills and ideals. A need to understand such intricacies during the design process dictates the bring about of methodologies capable of contemplating the specificity of the target groups. It is within this need that Child-centered design emerges as a way to make sense of the user's realistic needs and wants. Due to its novelty this methodology appears more commonly associated to interface design however more and more we see its exploration in Product Design. With that in mind we understand the difficulty of working with a child based target group and ultimately understand the vital importance of properly understanding their perspective and experience in order to achieve a better design solution.



# Research Questions

The research ultimately intended to answer the following a group of specific questions that grew out of a first more general main question, as such the questions appear below:

How can Product Design contribute in creating a more socially, economically and environmentally balanced product-consumer relationship?

Can the solution rely on developing a product meant to help stimulate a sense of affectivity over products?

Can the solution rely on developing a product meant to promote a country's craftsmanship where craftsmanship is seen as an example of an affectively charged product?

Should Design work this relationship with children since they represent future generations?

Can the answer rely on developing a children oriented product meant to stimulate a child's creativity and at the same time allow children to enhance their appreciation and level of knowledge of products rich in an affective effect such as those resulting from Portuguese craftsmanship, in which wickerwork is set as an example?

Can participatory methods enhance this Design contribution?





# Goals

## **General**

Research and understand how user-centered design methods can help achieve a design solution that helps the Pre-adolescent child understand and appreciate the grounds of Affective Design, where Portuguese Basketry is set as an example.

Contribute to the development of products that are more sustainable and mindful of the user's affective needs.

Contribute to the preservation of Portuguese Basketry not only as an art form but a symbol of national identity as well.

## **Specific**

Understand the children's appreciation and level of knowledge of products resulting from an Affective Design basis such as Portuguese craftsmanship.

Understand the intricacies of holding a user-centered design approach with a pre-adolescent child.

Contribute to the development of user-centered design approaches intended to have pre-adolescents as users.

Develop and successfully achieve a product able to help pre-adolescents connect with a type of product that holds a strong identity driven and affective value.

Acquire the ability to successfully employ research methods and techniques and improve the researcher's level of knowledge of research methods as well.

Achieve personal growth as a Product Designer and a researcher.



# Brief Methodological Note

Throughout this research a mixed methodology was used. This methodology compressed non-interventionist and interventionist qualitative methods. The development of this research focused on the processes of product development in Product Design and research methods that focused on the sustainable development of products through user-centered design techniques.

With the intention to answer the aforementioned research questions, a theoretical moment takes place in which a qualitative non-interventionist methodology was used to gather, analyse and critically synthesized the literature found on the research topics resulting in a theoretical framework. From this theoretical framework a hypothesis emerged.

To prove this hypothesis right, an interventionist qualitative method named active research is employed due to its experimental approach. This moment was sectioned into three separate moments each making use of sample groups. The first stage of this moment resulted in a preliminary study that comprised a questionnaire and a participatory session, both were held with sample groups of different proportions due to the goals of each but both were administered to subjects that represented the targeted group. This preliminary study helped set the requirements of the second stage that encompassed the interventionist qualitative method of project development that ultimately generated a product. Subsequently the third moment of the active research method encompassed the evaluation of the solution.

Therefore the product that originated a prototype was subjected to a usability test in order to further evaluate the efficiency of the solution. Because the product needed to be tested with more than one subject, it was established that the test would include six subjects, three girls and three boys with the targeted ages. Six prototypes were made and tested over the course of a week, during this time each subject with experience the product in their own environment and a their own time without the interference of the research team.

The results of the usability test lead to a revisional moment that made it possible to rectify and adjust the prototype in order for it to better answer the needs of the user.

From the gathered results conclusions were drawn regarding the project and the research made, this conclusions helped prove the hypothesis and answer the pre-established research questions. The process also made

it possible to confirm that a real contribute to the scientific community was made and synthesize a number of future recommendations for future researchers of the field to follow. The entirety of the process is exposed in fig.2.

In conclusion, we find of relevance to mention that during research process, the research questions were recurrently analysed in order to confirm the appropriateness of the used methods, therefore we ultimately analysed the research question in three different ways that stand illustrated in fig. 1.

The illustrated approaches are the literature review, the preliminary study and the usability test, this three methods combined defined the methodology used in this research.

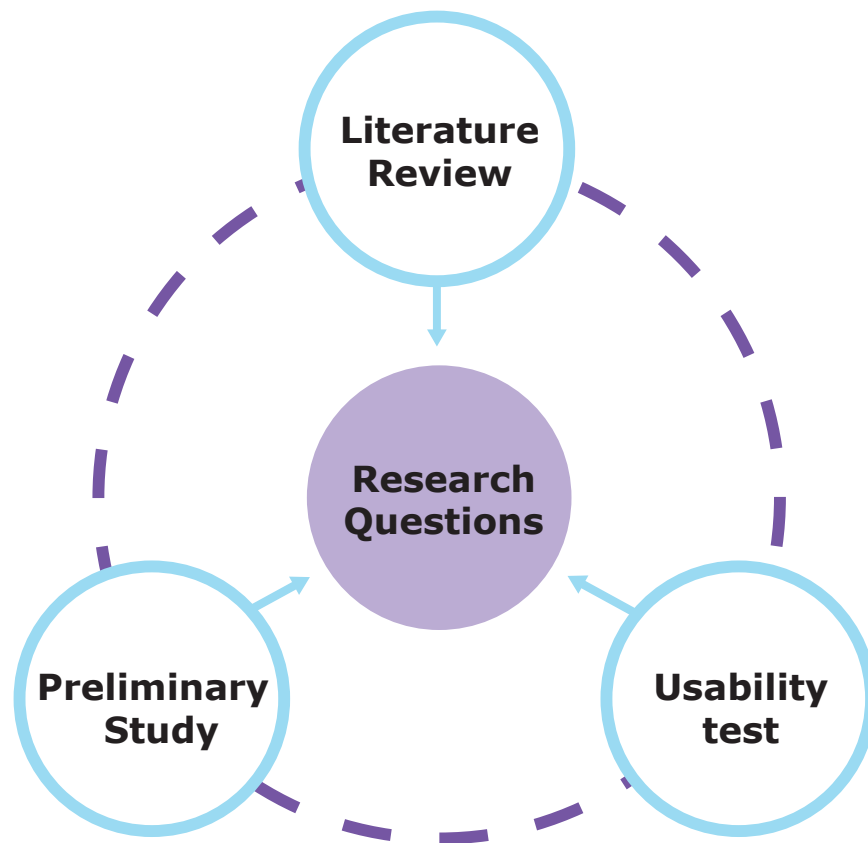


fig.1 Methodological Triangle  
Source: Author

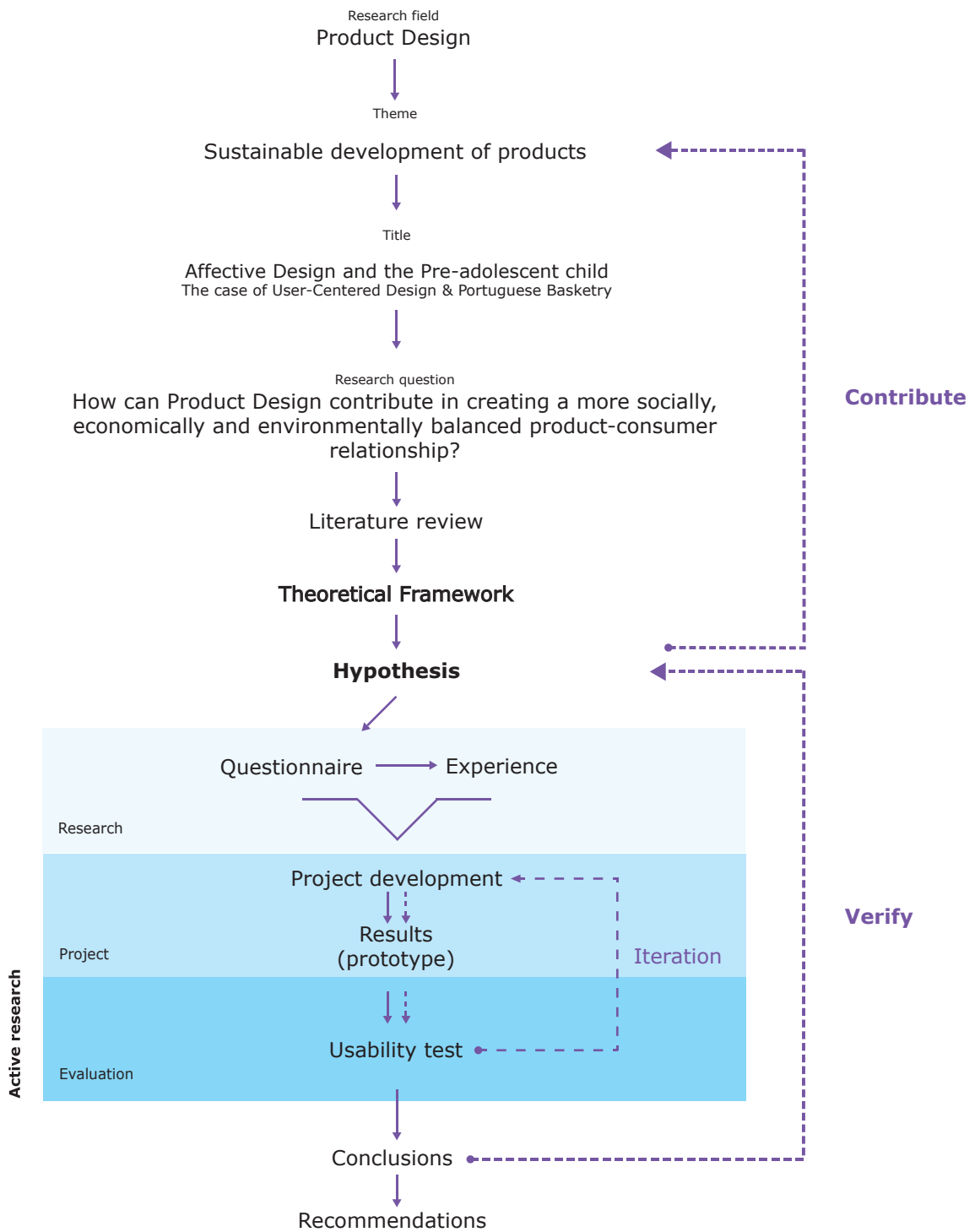


fig.2 Process organogram  
Source: Author



# Part II

# Theoretical Framework

## **Affective Design, Sustainability & National Identity**

### **Affective Design**

- 1.1. Human's wants and needs
  - 1.1.1 Consumerism
- 1.2 Meaning and meaningful

### **Sustainability**

- 1.1 Material

### **National identity**

- 1.1 Portuguese identity
  - 1.1.1 Handicrafts
    - 1.1.1.1 Textiles
    - 1.1.1.2 Earthenware
    - 1.1.1.3 Jewelry
    - 1.1.1.4 Basketry
      - 1.1.1.4.1 History
      - 1.1.1.4.2 Origin
      - 1.1.1.4.3 By areas

## **User-centered Design & The pre adolescent Child**

### **User-Centered Design**

- 1.1 Child-Centered Design
  - 1.1.1 The pre adolescent child

### **Design Process**

- 2.1 Tools and techniques





# 4. Theoretical framework

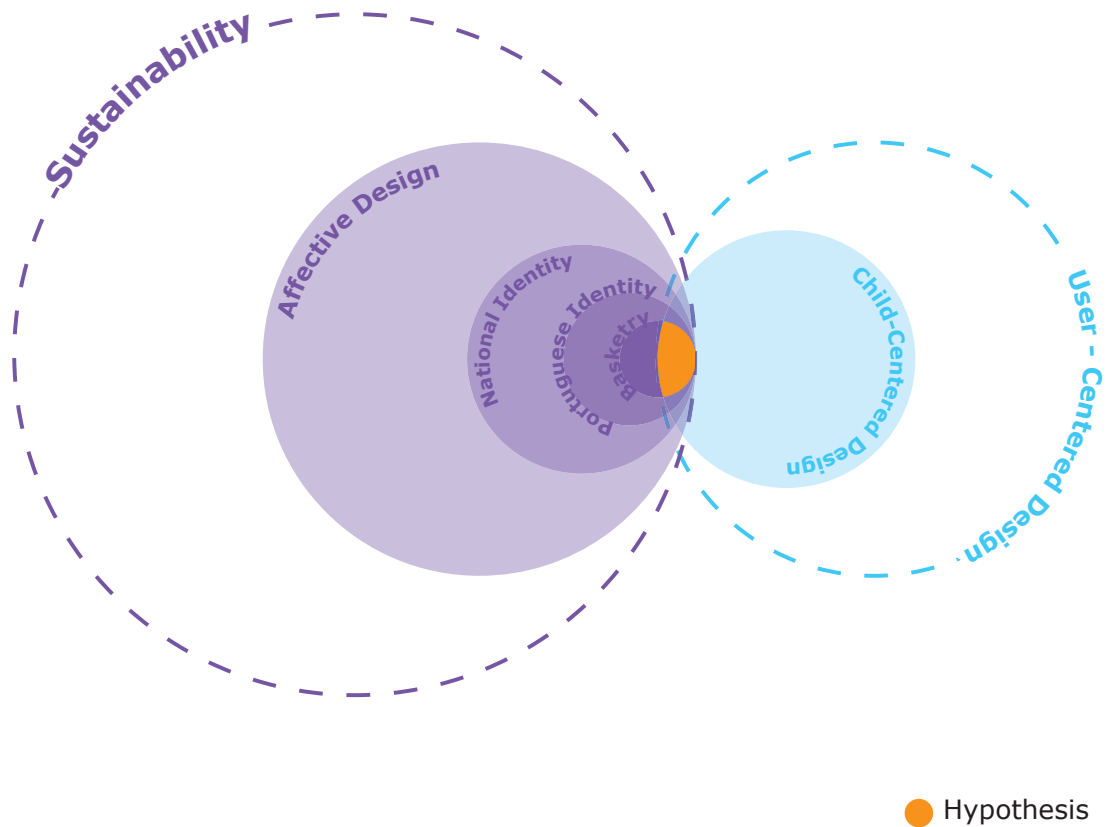


fig.3 Scheme of the main field areas  
Source: Author

Fig. 3 reveals the main fields of study with interest to this research in it the hypothesis place is revealed to better understand its theoretical framework.

## Affective Design, Sustainability & National identity

### Affective Design

Borjesson (2006) states that looking at the body and mind separately will prevent holistic thinking about human behavior: the rational and intellectual, as opposed to emotional and conscious this will prevent the dominance of the unconscious. This denial of an existing dialogue between the two entities body and mind still has an impact on discourse on beauty and aesthetic. A crucial step in the overall understanding of this phenomenon is to enjoy the process by which objects are seen in the mind of the viewer through perception. Perception involves immediate reaction [non-reflective], which should not involve intelligence. She concludes by stating that emotion is the antonym of the intellect and questions how separated they actually are in real life.

In that line of thought, Desmet (2002) presents the given model in Figure 4, the model intends to explore the process of evoking emotions. As such, there are three variables that are interconnected emotion, stimulus and concern. These three variables and their interconnection,

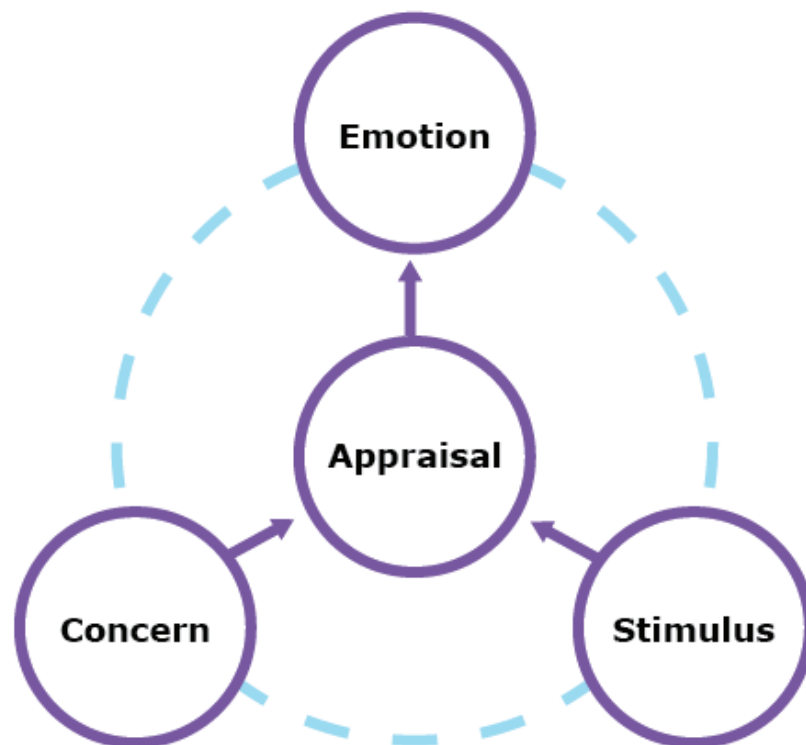


fig.4 Relations at play when evoking emotions  
Source: Adapted by the author from: DESMET, Pieter - Designing emotions. Technische Universiteit Delft, 2002. Additional note (PHD Thesis).

determine if the stimulus (can be the product itself or not) incites an emotion, and if so, which emotion is experienced.

The most important feature of this model relies on the simple fact that there isn't an unilateral relation between the design, the product and the

provoked emotion. Therefore according to Desmet (2002) an emotion is not provoked by a product but by its significance and as such the emotions can only be understood by the one who experiences them.

In compliance with Borjesson (2006) there is evidence that the preconditions for the longevity of the relationship are not dependent on the object's physical qualities and these are not necessarily entirely rational: the subconscious may play an active role in the decision leading up to this situation.

Damasio (2000) adds that affective decision-making is claimed to add value to reflected decisions, as it is not confined to the conscious mind and because of that it represents more dimensions including feelings, emotions and moods, which all go beyond the physical qualities of objects.

Van Pattern (2008) argues that StrangeMaking<sup>1</sup> is valued over SenseMaking<sup>2</sup>, as he understands that this can relate to our waste culture due to the fact that too many objects have little identifiable meaning, they don't make sense, and that determines their wastage. Van Pattern goes on to add that as consumers often are selective, attention to SenseMaking early in the design process could prevent certain objects from being produced instead of wasted as shelf-warmers or being bought but not consumed. He also defines a new concept VisualSenseMaking<sup>3</sup> that he defines as deciding the meaning of an object after we have seen a pattern, understood it and decided that the object means something positive to us, and therefore it is worth the buy and consequent usage.

Borjesson (2007) states that we learn while moving through the flow but we lack stability, and as such contradictions and rapid change make it difficult to judge the information that is being given. It is in this atmosphere that feelings and emotions interact to form an affective response and the decision to establish a relationship with the object is taken as fig.5 (next page) suggests.

Therefore, Borjesson (2007) states that Emotional design might guarantee a human/object relation but not necessarily a durable one. It is the affective component, which has a determining impact on longevity.

Borjesson (2007) comprehends that this relationship is established as the brain interprets information in pattern recognition which is based on experience. Our ability to recognise improves over time and with it our ability to take action. But recognition by itself is not enough. As there are reasons to believe that the factors deciding the result of the first encounter between subject and object are more complex than often claimed. Affect is pre-individual but not pre-social. We are conditioned to be affective, to mix conscious experiences with subconscious, to act outwards by showing emotions, and to act inwards by having feelings, but it is not clear to what extent respective experiences influence affect, only that we cannot control how affect in its turn influences decision-making.

*"To design for attraction at first sight, which is often a precondition for a continued relationship, is thus not solely about physical features and simplicity.*

---

1 way of making something different or strange

2 way of making sense of something

3 way of visually making sense of something



consumed or eventually kept. It is well-known that food and fashion items are often wasted before being consumed or shortly after but there is probably less awareness about the same fate often hitting consumer durables

(Borjesson, 2007).

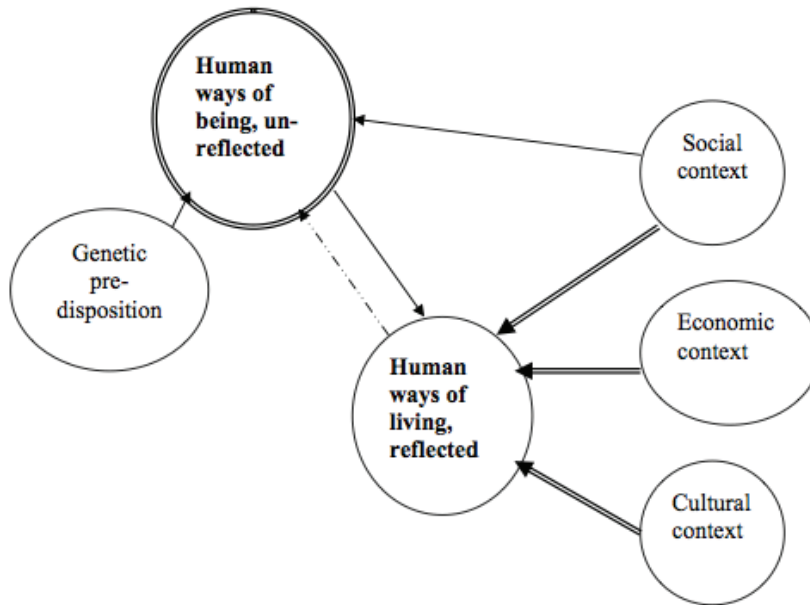


fig.6 Relation in human ways of being with humans ways of living  
 Source: BORJESSON, K. (2007). Affect, Emotion and Rationality. Contradictory variables in the aspiration for object longevity? [On line]. [Access. 10th November.2015]. Available in:<http://storage.canalblog.com/52/04/299316/32118591.pdf>.

To better understand this relation Borjesson (2007) identifies two distinctive concepts human ways of being and human ways of living as shown in figure 6. She defines that human ways of being are constantly adapting to a changing context. On the other hand, human ways of living are more individual and fast changing due to social, economic and cultural influence. As such, ways of living could be compared to projects with a clear start and end. Humans are aware of their lifestyles and they are therefore relatively easy to identify and study. Ways of being are ongoing processes of which humans are less aware. They have to be identified by study over time and also by observing human thoughtless acts. She goes on to add that the conclusion drawn from this concepts was that a long-lasting human/object relationship is not possible if an object is designed for a lifestyle or certain way of living.

*"But as affect encompasses emotion, which is favoured by the brain over rationality, discouragement sets in and we rapidly waste the object or at least long before its physical lifespan has come to an end. It is obvious that the issue of meaning is very critical for the build up phase."* (Borjesson, 2007, p.7)

Borjesson (2007) concludes by establishing that designers aiming at durable attachment with their designs and the resulting positive impact on sustainability must have raised awareness in a number of important distinctions stated below:

\_ There are two forms of experience, lived and learned, lived experience is the foundation for intuition.

\_ The foundation for reflected thought, which includes but is not equal to rationality.

The latter is based on controlled input, which most state of affairs cannot offer.

\_ Intuition enhances intellectual thought: it adds more dimensions, as it accesses the subconscious mind, but it does not promote rational thinking in its scientific sense.

\_ Human ways of being adapt continuously through influence from lived experiences and unlearns slowly. Once adapted, they inform our being from a developed basis.

\_ Human ways of living changes fast: they both learn and unlearn relatively rapidly.

The subconscious is the 'host' of lived experience and human ways of being. It is thus not static but adapts continuously, which means that our 'self' is constantly developing even if not changing.

(Borjesson, 2007)

*"If notice is taken of these distinctions there is good chance of arriving at affective sustainability in design: objects that retain their significance over time and in a changing human context. 'Newness' as a cultural code has to be replaced by 'sustainability', which would be a fundamental project not least for design education."*

(Borjesson, 2007, p.10-11)

We can find example in certain ingredients of our culture, and in them those that are manifested as traditions, become adapted by the subconscious as cultural codes and lived experiences. These sometimes become overlapping. Some cultural codes, like the importance assigned to newness are counteracting sustainability with all the apparent power of the subconscious.

Affect is the moderator of emotions (which are outward) and feelings (which are inward). Affective decision making is as such, not totally unreflected as emotions have a cognitive component. It is this component, which makes emotions unstable and hence emotional design less sustainable. Meaning is created through patterns, which are reliant on conspicuous details to make sense. Simplification rather than simplicity facilitates the search for meaning of an object.

(Borjesson, 2007)

Norman (2004) studies of emotion, suggest that the human attributes discussed by Borjesson (2007) result from three different levels of the

brain: the automatic, prewired layer, called the visceral level, the part that contains the brain processes that control everyday behavior, known as the behavioral level and the contemplative part of the brain, or the reflective level. Each level plays a different role in the total functioning of people. He adds that because of it each level requires a different style of design. As such, the three levels in a way reflect the biological origins of the brain, starting with primitive one-celled organisms and slowly evolving to more complex animals, to the vertebrates, the mammals, and finally, apes and humans.

Norman (2004) understands that for simple animals, life is a continuing set of threats and opportunities, and an animal must learn how to respond appropriately to each. The basic brain circuits, then, are really response mechanisms that work to analyse a situation and respond.

Norman (2004) defines the three levels starting with the visceral level that he states as being fast because it is responsive for rapid judgments of what is good or bad, safe or dangerous, and sends appropriate signals to the muscles (the motor system) and alerts the rest of the brain. This is the start of affective processing. He adds that these are biologically determined and can be inhibited or enhanced through control signals from the brain. Secondly he defines the behavioral level as the site of most human behavior adding that its actions can be enhanced or inhibited by the reflective layer and, in turn, it can enhance or inhibit the visceral layer. The highest of the described layers is the reflective thought. It does not have direct access either to sensory input or to the control of behavior. Instead it watches over, reflects upon, and tries to bias the behavioral level.

Norman (2004) defines the behavioral level in human beings as being especially valuable for well-learned, routine operations. At the highest evolutionary level of development, the human brain can think about its own operations. And as such this is the foundation of reflection, of conscious thought, of the learning of new concepts and generalization. The behavioral level is also not conscious, which links to why we can successfully drive our automobile subconsciously at the behavioral level while consciously thinking of something else at the reflective level.

Norman (2004) takes example of three activities to explain the different ways these levels impact us. If we take the activity of riding a roller coaster, chopping and dicing food with a sharp, balanced knife and a solid cutting board, and contemplating a serious work of literature. He explains that the first is the most primitive, the visceral reaction to falling, excessive speed, and heights. The second, the pleasure of using a good tool effectively, refers to the feelings accompanying skilled accomplishment, and derives from the behavioral level. This is the pleasure any expert feels when doing something well, such as driving a difficult course or playing a complex piece of music. This behavioral pleasure, in turn, is different from that provided by serious literature or art, people pay money to get scared. The roller coaster pits one level of affect (the visceral sense of fear) against another level (the reflective pride of accomplishment).

Norman (2004) states that the most interesting of all is when one level plays off of another, for example the roller coaster. He questions if the roller coaster is so frightening, why its popularity. He differentiates at least two reasons. First, some people seem to love fear itself. They enjoy the high arousal and increased adrenaline rush that accompanies danger. The second reason comes from the feelings that follow the ride, the pride in conquering fear and of being able to brag about it to others. In both cases, the visceral angst competes with the reflective pleasure.

The three levels interact with one another, each modulating the others. Normans (2004) adds that when activity is initiated from the lowest, visceral levels, it is called bottom-up. When the activity comes from the highest, reflective level, it is called top-down behavior. These terms come from the standard way of showing the processing structures of the brain, with the bottom layers associated with interpreting sensory inputs to the body and the top layers associated with higher thought processes, much as illustrated in Figure 7 Bottom-up processes are those driven by perception whereas top-down are driven by thought. The brain changes its manner of operation when bathed in the liquid chemicals called neurotransmitters. A neurotransmitter changes how neurons transmit neural impulses from one nerve cell to another (that is, across synapses). Some neurotransmitters enhance transmission, some inhibit it. See, hear, feel, or otherwise sense the environment, and the affective system passes judgment, alerting other centers in the brain, and releasing neurotransmitters appropriate to the affective state. That's bottom-up activation. Think something at the reflective level and the thoughts are transmitted to the lower levels which, in turn, triggers neurotransmitters.

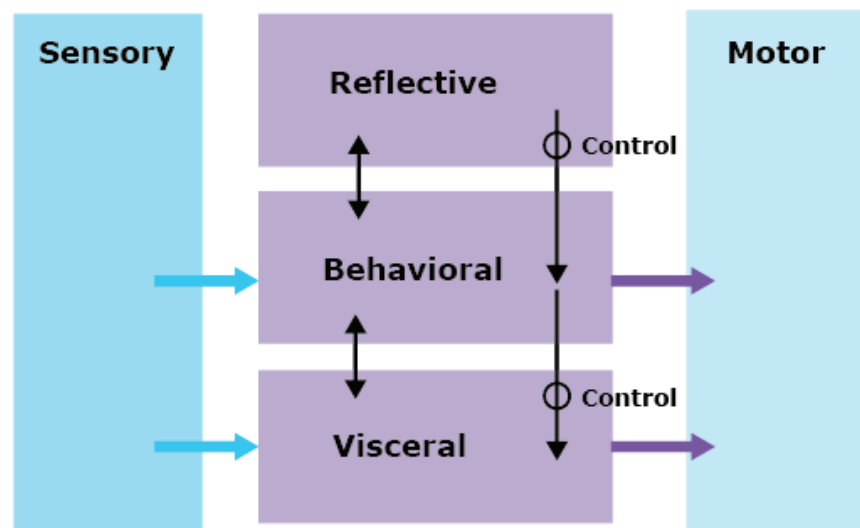


fig.7 Three levels of processing  
 Source: Adapted by the author from: NORMAN, Donald A. (2004). Emotional Design (why we love (or hate) everyday things, New York, Basic Books. ISBN: 0-465-05135-9

The result is that everything we do has both a cognitive and an affective component (cognitive to assign meaning, affective to assign value). Norman (2004) concludes by stating that we cannot escape affect as it is always there. More important, the affective state, whether positive or negative affect, changes how we think.



In compliance with Norman (2004) when you are in a state of positive affect, the very opposite actions take place. Neurotransmitters broaden the brain processing, the muscles can relax, and the brain attends to the opportunities offered by the positive affect. The broadening means that you are now far less focused, and far more likely to be receptive to interruptions and to attending to any novel idea or event. Positive affect arouses curiosity, engages creativity, and makes the brain into an effective learning organism. With positive affect, you are more likely to see the forest than the trees, to prefer the big picture and not to concentrate upon details. On the other hand, when we are sad or anxious, feeling negative affect, we are more likely to see the trees before the forest, the details before the big picture. The role these states have in design are various. First, someone who is relaxed, happy, in a pleasant mood, is more creative, more able to overlook and cope with minor problems with a device, especially if it's fun to work with.

Norman (2004) continues by saying that, when people are anxious, they are more focused, the designer must pay special attention to ensure that all the information required to do the task is continually at hand, readily visible, with clear and unambiguous feedback about the operations that the device is performing. Designers can get away with more if the product is fun and enjoyable. Things intended to be used under stressful situations require a lot more care, with much more attention to detail. Norman (2004) adds that an interesting effect of the differences in thought processes of the two states is the impact upon the design process itself. Design and problem solving, requires creative thinking followed by a considerable period of concentrated, focused effort. In the first case, creativity, it is good for the designer to be relaxed, and in a good mood. Thus, in brainstorming sessions, it is common to warm up by telling jokes and playing games. No criticism is allowed because it would raise the level of anxiety among the participants. Good brainstorming and unusual, creative thinking require the relaxed state induced by positive affect. Once the creative stage is completed, the ideas that have been generated have to be transformed into real products. Now the design team must exert considerable attention to detail. Here, focus is essential. One way to do this is through deadlines just slightly shorter than it would feel comfortable. Here is the time for the concentrated focus that negative affect produces. This is one reason people often impose deadlines on themselves, and then announce those deadlines to others to make them real. Their anxiety helps them get the work done.

Norman (2004) states that although the visceral level is the simplest and most primitive part of the brain, it is sensitive to a very wide range of conditions. These are genetically determined, with the conditions evolving slowly over the time course of evolution. They all share one property, however: the condition can be recognized simply by the sensory information. The visceral level is incapable of reasoning, of comparing a situation with past history. It works by what cognitive scientists call pattern matching. According to Norman, designers can use this knowledge of the brain to make designs more effective, there is no simple set of rules. The human mind is complex, and although all people have basically the same form of body and brain, they also have individual emotions, moods, traits, and personality, all aspects of

the different ways in which people's minds work, especially along the affective, emotional domain. Emotions change behavior over a relatively short term, as they are responsive to the immediate events. Emotions last for relatively short periods—minutes or hours. Moods are longer lasting, measured perhaps in hours or days. Traits are very long-lasting, years or even a lifetime. And personality is the particular collection of traits of a person that last a lifetime. But all of these are changeable as well. We all have multiple personalities, emphasizing some traits when with families, a different set when with friends. We all change our operating parameters to be appropriate for the situation we are in. This phenomenon occurs in almost all aspects of life, whether in interactions with people, in a sport, a book, or even a walk in the woods. Norman (2004) warns that this phenomenon can bedevil the designer who wants to know how to design something that will appeal to everyone as one person's acceptance is another one's rejection. Worse, what is appealing at one moment may not be in another. The source of this complexity can be found in the three levels of processing. At the visceral level, people are pretty much the same all over the world. Although almost everyone is born with a fear of heights, this fear is so extreme in some people that they cannot function normally, they have acrophobia. Yet others have only mild fear, and they can overcome it sufficiently to do rock climbing, circus acts, or other jobs that have them working high in the air.

Norman (2004) goes on to add that the behavioral and reflective levels, are very sensitive to experiences, training, and education. Cultural views have huge impact here as what one culture finds appealing, another may not. If we take teenage culture we understand that it seems to dislike things solely because adult culture likes them. But the challenges should be thought of as opportunities. As such designers will never lack for things to do, for new approaches to explore. For the visceral level Norman states that it is pre consciousness and pre thought. This is where appearance matters and first impressions are formed. Visceral design is about the initial impact of a product, about its appearance, touch, and feel. The behavioral level is about use, about experience with a product. But experience itself has many sides, like function, performance, and usability. A product's function specifies what activities it supports, what it is meant to do, if the functions are inadequate or of no interest, or if the product is of little value. Performance is about how well the product does those desired functions, if the performance is inadequate, the product fails. Usability describes the ease with which the user of the product can understand how it works and how to get it to perform. Confusion or frustration can affect the usability of the product and negative emotions result. But if the product does what is needed, if it is fun to use and easy to satisfy goals with it, then the result is warm, positive affect. It is only at the reflective level that consciousness and the highest levels of feeling, emotions, and cognition reside. It is only here that the full impact of both thought and emotions are experienced. At the lower visceral and behavioral levels, there is only affect, but without interpretation or consciousness. Interpretation, understanding, and reasoning come from the reflective level.

Norman (2004) concludes by arguing that out of the three levels, the reflective one is the most vulnerable to variability through culture,

experience, education, and individual differences. This level can also override the others. Hence, one person's liking for otherwise distasteful or frightening visceral experiences that might repel others, or another's intellectual dismissal of designs others find attractive and appealing. Sophistication often brings with it a peculiar disdain for popular appeal, where the very aspects of a design that make it appeal to many people distress some intellectuals. There is one other distinction among the levels, time. The visceral and behavioral levels are about now, your feelings and experiences while actually seeing or using the product. But the reflective level extends much longer, through reflection we remember the past and contemplate the future. Reflective design, therefore, is about long-term relations, about the feelings of satisfaction produced by owning, displaying, and using a product. A person's self-identity is located within the reflective level, and here is where the interaction between the product and our identity is important as demonstrated in pride (or shame) of ownership or use. Customer interaction and service matter at this level.

In conclusion and in compliance with Norman (2004) the three levels can be mapped to product characteristics like this:

Visceral design > Appearance

Behavioral design > The pleasure and effectiveness of use

Reflective design > Self-image, personal satisfaction, memories

But even these simplifications are difficult to apply. According to Norman (2004) that fact is because no single product can hope to satisfy everyone. The designer must know the audience for whom the product is intended any real experience involves all three levels: a single level is rare in practice, and if it exists at all it is most likely to come from the reflective level than from the behavioral or the visceral. Norman (2004) adds that true, long-lasting emotional feelings take time to develop and that they come from sustained interaction. Surface appearance and behavioral utility play relatively minor roles. Instead, what matters is the history of interaction, the associations that people have with the objects, and the memories they evoke. He suggests that we consider mementoes, postcards and souvenir monuments that are considered to be cheap and vulgar but while this may be true of the object itself, that object is important only as a symbol, as a source of memory, of associations. In conclusion they do not pretend to be art, they work as aids to memory.

*"We become attached to things if they have a significant personal association, if they bring to mind pleasant, comforting moments(...)Our attachment is really not to the thing, it is to the relationship, to the meanings and feelings the thing represents."*

*(Norman, 2004, p. 48)*

Perhaps the objects that are the most intimate and direct are those that we construct ourselves, hence the popularity of home-made crafts, furniture, and art. Similarly, personal photographs may have faded, or

be torn and repaired with tape but their surface appearance is less important than their ability to evoke the memory of particular people and events. Although we like to look at photographs, we do not like to take the time to do the work required to maintain them and keep them accessible. The design challenge is to keep the virtues while removing the barriers: make it easier to store, send, share. Make it easier to find just the desired pictures years after they have been taken and put into storage.

(Norman, 2004, p.48-49)

*"The overall impact of a product comes through reflection — in retrospective memory and reassessment."*(Norman, 2004, p. 88)

### 1.1 Human's wants and needs

*"Need: Much recent design as satisfied only evanescent wants and desires, while the genuine needs of man have often been neglected. The economic, psychological, spiritual, social, technological, and intellectual needs of a human being are usually more difficult and less profitable to satisfy than the carefully engineered and manipulated "wants" inculcated by fad and fashion" (Papanek, 2011, p.4)*

As stated by Chapman (2008) needs may be mapped by polarizing them in two distinct categories consisting of innate (physiological) needs and acquired (psychological) needs.

Maslow [1984] categorizes both innate and acquired needs within a pyramid with five hierarchical levels represented in fig.8.

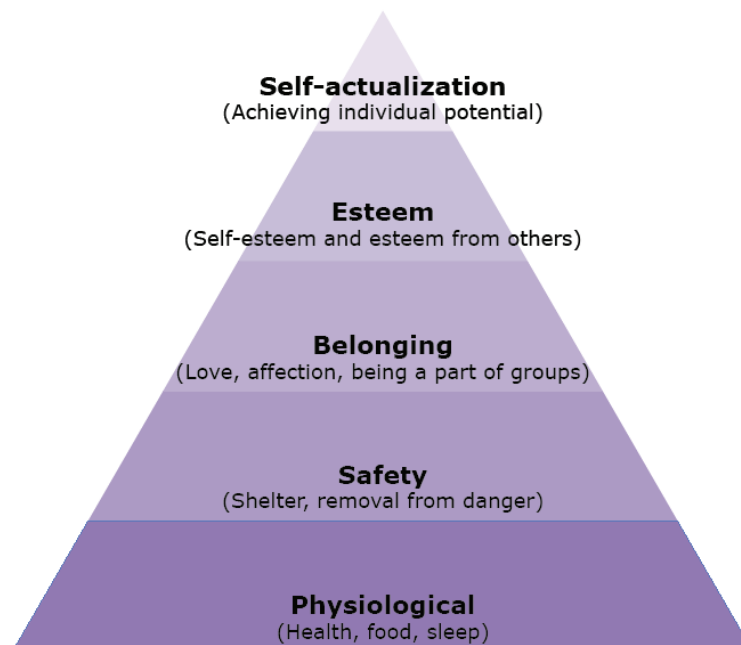


fig.8 Maslow's pyramid of needs

Source: Adapted by the author from: MASLOW, Abraham (2012) [1984]. A Theory of human motivation. U.S.A: Start Publishing LLC.

ISBN: 978-1-62793-396-4

Known as Maslow's Hierarchy of Human Needs, this theoretical model outlines five key levels of need, consisting of physiological needs, such as water, food and breathable oxygen, safety and security needs, such as shelter, stability and a safe place in which to live; social needs, which may include companionship, tenderness and, perhaps, a sense of belonging, ego needs, which regularly include the need for prestige, status and positive self-esteem, and finally self-actualization needs such as the successful accomplishment of personal goals. In Maslow's terminology, a need does not become salient until the needs below it are met.

According to Norman (2004) the distinction between the terms needs and wants is a traditional way of describing the difference between what is truly necessary for a person's activities (needs) versus what a person asks for (wants). Needs are something determined by a task. Wants are determined by culture, by advertising, by the way we view ourselves and our self-image. An example of that is given by considering that a student's backpack or even a paper bag would work perfectly fine for carrying papers, however it would be embarrassing to carry one into a serious situation. It is important to satisfy people's true needs, including the requirements of different cultures, age groups, social and national requirements. Norman adds that if we add the necessity to cater to the many wants, whims, opinions, and biases of the people who actually purchase products, than the task becomes a major challenge.

According to Max-Neef (1991) it is traditionally believed that human needs tend to be infinite, as they change all the time, and tend to be different in each culture or environment, they are different in each historical period as well. It is suggested by Max-Neef that such assumptions are inaccurate, as they are the product of a conceptual shortcoming. A prevalent shortcoming in the existing literature and discussions about human needs is stated to be the fundamental difference between needs and satisfiers and those needs are either not explicit or overlooked altogether. A clear distinction between both concepts is considered necessary for both epistemological and methodological reasons. Max-Neef implies that human needs must be understood as a system in which all human needs are interrelated and interactive. He makes the remark to the sole exception of the need of subsistence, that is, to remain alive, no hierarchies exist within the system. On the contrary, simultaneities, complementarities and trade-offs are characteristics of the process of needs satisfaction. There is no one-to-one correspondence between needs and satisfiers. A satisfier may contribute simultaneously to the satisfaction of different needs or, conversely, a need may require various satisfiers in order to be met.

Max-Neef (1991) states that not even these relations are fixed. They may vary according to time, place and circumstance. An example is given, in which we are asked to consider that a mother breastfeeding her baby can be simultaneously satisfying the infant's needs for subsistence, protection, affection and identity. Having Max-Neef established a difference between the concepts of needs and satisfiers he set as possible to state two additional postulates. The first, that fundamental

human needs are finite, few and classifiable. Secondly, fundamental human needs (such as those contained in the system proposed) are the same in all cultures and in all historical periods. What changes, both over time and through cultures, is the way or the mean by which the needs are satisfied.

Max-Neef (1991) adds that each economic, social and political system adopts different methods for the satisfaction of the same fundamental human needs. In every system, they are satisfied (or not satisfied) through the generation (or non-generation) of different types of satisfiers. We may go as far as to say that one of the aspects that define a culture is its choice of satisfiers. Whether a person belongs to a consumerist or to an ascetic society, his/her fundamental human needs are the same. What changes is his/her choice of the quantity and quality of satisfiers. Max-Neef (1991) sums it up by stating that what is culturally determined is not the fundamental human needs, but the satisfiers for those needs. Cultural change is, among other things, the consequence of dropping traditional satisfiers for the purpose of adopting new or different ones.

Max-Neef (1991) has emphasized that what we require is a need's theory for development. This poses the problem of constructing a taxonomy of fundamental human needs which may serve as an instrument for both policy and action. Undoubtedly, there are many ways in which needs may be classified. Hence, any categorization must be regarded as provisional and subject to modification as new evidence arises and calls for changes. For the purposes of development, a multi-dimensional taxonomy which establishes a clear-cut difference between needs and satisfiers is a useful and feasible tool. Unfortunately, in formulating such a classification, we lay ourselves open to the charge of arbitrariness. But, considering that the task is absolutely necessary, we can minimize the risks if we abide by the proposed conditions:

1. The classification must be understandable. The needs listed must be readily recognizable and identifiable as one's own.
2. The classification must combine scope with specificity. It must arrive at a limited number of needs which can be clearly yet simply labeled but, at the same time, be comprehensive enough to incorporate any fundamental felt need.
3. The classification must be operational. For every existing or conceivable satisfier, one or more of the needs stated must appear as a target-need of the satisfier; the classification should allow for an analysis of the relationship between needs and the ways in which they are satisfied.
4. The classification must be critical. It is not sufficient for the categorization to relate satisfiers to needs. It is essential to detect needs

for which no desirable satisfier exists. Also, it is to identify and restrain those satisfiers that inhibit the actualization of needs.

5. The classification must be propositional. To the extent that it is critical and capable of detecting inadequacies in the relation between the existing satisfiers and the fulfillment of needs, classification should serve as a trigger mechanism to work out individuals or groups from diverse cultures and in different historical moments, might vary considerably.

Max-Neef (1991) presents examples of Satisfiers and Their Attributes and because satisfiers have various characteristics, he suggests for analytical purposes five types that may be identified, namely: violators or destroyers, pseudo-satisfiers, inhibiting satisfiers, singular satisfiers and synergic satisfiers.

Destroyers. Violators or destroyers are elements of a paradoxical nature. When applied with the intention of satisfying a given need, not only do they annihilate the possibility of its satisfaction over time, but they also impair the adequate satisfaction of other needs. These paradoxical satisfiers seem to be related particularly to the need for protection. This need may bring about aberrant human behavior to the extent that its non-satisfaction is associated with fear. The special attribute of these violators is that they are invariably imposed on people. Max-Neef (1991) explains that pseudo-satisfiers are elements that generate a false sense of satisfaction of a given need. Although not endowed with the aggressiveness of violators or destroyers, they may on occasion annul, in the not too long term, the possibility of satisfying the need they were originally aimed at fulfilling. Their main attribute is that they are generally induced through propaganda.

### **1.1.1. Consumerism**

Berger (2010) states that people need to eat, be clothed, and take care of other biological imperatives, so consumption is inherently a part of everyone's life in every society. Thus we have consumer cultures in which buying new products and services plays a major role in most of everyone's lives, often to the detriment of public spending, the simplest way to define consumer cultures is that they are societies in which spending for private needs and desires overwhelms spending on public ones. Berger (2010) goes on to add that in first place there's the view that consumer culture is premised upon the expansion of capitalist commodity production which has given rise to a vast accumulation of material culture in the form of consumer goods and sites for purchase and consumption. This has resulted in the growing salience of leisure and consumption activities in contemporary Western societies which, although greeted as leading to a greater egalitarianism and individual freedom by some, is considered by others as increasing the capacity for ideological manipulation and seductive containment of the population from some alternative set of better social relations. Secondly, Berger (2010) continues by explaining that there is the more strictly sociological view that the satisfaction derived from goods relates to their socially structured access in which satisfaction and status depend upon displaying and sustaining differences within conditions of inflation. The focus here is upon the different ways in which people use goods in order

to create social bonds or distinctions. Thirdly, there is the question of the emotional pleasures of consumption, the dreams and desires which become celebrated in consumer cultural imagery and particular sites of consumption, which variously generate direct bodily excitement and aesthetic pleasure. In compliance with Berger (2010) if we understand the mechanism and motives of the group mind, it is not possible to control and regiment the masses according to our will without their knowing it. As such, mass psychology is far from being an exact science and the mysteries of human motivations are not all revealed. Accordingly, in order for consumer cultures to develop, people have to change their mindsets and the way they think about consumption. One of the main things consumer cultures need to do, in order to develop, is to encourage people to cast off notions about asceticism and minimizing consumption. Berger (2010) argues that the fundamental aim in life is to live and to live pleurably. In order to achieve this, each of us tries to deal with and dispose of destructive forces within himself, venting, diverting and fusing them in such a way to obtain the maximum security he can in life, an aim which we achieve by infinitely various, subtle and complicated adaptations. Some measure of greed exists unconsciously in everyone. It represents an aspect of the desire to live, one which mingled and fused at the outset of life with the impulse to turn aggression and destructiveness outside ourselves against others. By its very nature it is endless and being a form of the impulse to live, it ceases only with death. The longing or greed for good things can relate to any and every imaginable kind of material possessions, bodily or mental gifts, advantages and privileges.

In line with Berger (2010) beside the actual gratification they may bring, in the depths of our minds they all ultimately signify one thing. They stand as proofs to us, if we get them, that we are ourselves good, and full of good, and so are worthy of love, or respect and honour, in return. Thus they serve as proofs and insurances against our fears of the emptiness inside ourselves, or of our evil impulses which make us feel bad. Berger (2010) adds that one great reason why a loss of any kind can be so painful is that unconsciously it represents the converse idea, that we are being exposed as unworthy of good things, and so our deepest fears are realized. From a psychoanalytic standpoint, then, each of us has an unconscious need for material things, and the financial and psychological benefits that lead to our getting and having things can never be satisfied. We are, so to speak, hardwired to want things endlessly, since having things is an instinctive need we have to feel alive and good.

*"Consumption is a 'transformative and transcendent process of the appropriation and conversion of meaning. It is this appropriation and conversion that we as designers need to address, as it is through this process that strong, meaningful connections between people and things are forged." (Chapman, 2008, p.38-39)*

Sanders adds that:

*"No, design is not serving people today. Design is serving markets, not people. Design is serving the needs of companies, not people. And as a result, consumerism is out of bounds. We have too many "innovative" products that*



*we desire but do not need. We are degrading the planet with the debris of overabundance and overconsumption. Environmental sustainability is in big trouble. Meanwhile, cultural and social sustainability are finally being recognized as having tremendous importance to human survival and wellbeing."*

*(Sanders, 2006, p.1)*

*"Conspicuous consumption has resulted in many non sustainable products and practices. In fact, many consumers are not even aware of or are confused about the negative environmental impacts of their behavior. Consumerism has also led to a preoccupation in the business sector with innovation at all costs. Fortunately, a countermovement to this pattern has recently become evident. First, the recession has made it abruptly and abundantly clear that continuous conspicuous consumption can no longer be maintained. And at the same time we see that many people are seeking ways to be socially and environmentally responsible."* (Sanders & Stappers, 2008, p.2)

*"The consumerist mode demands that satisfaction needs to be, must be, better be, instant, while the sole value, the only use, of objects is their capacity to give satisfaction. Once satisfaction stops (because of the object's wear and tear, because of their excessive, increasingly dull familiarity, or because other, less familiar, untested and thus more exciting replacements are on offer) there is no reason to clutter the house with those useless objects."* (Bauman, 2004, p.64)

## **1.2. Meaning and meaningful**

*"...it is clear that design plays a key role in developing these emergent concepts, which clearly signposts opportunities for collaborative work that spans disciplines."* (Chapman, 2008, p.39)

As stated by Chapman (2008) it may be asserted that although a designer can certainly elicit within users an emotional response to a given object, the explicit nature of the response is beyond the designer's control, the unique assemblage of past experiences that is particular to each user, their cultural background and life journey determines this.

*"There is a multitude of interpretations regarding how emotions should be linked to design and not least to designing."* (Borjesson, 2007, p.2 )

As stated by Borjesson (2007) what an object means to its presumed user is very critical for a relation build up and not to be confused with meaningful, which is dependent on usability. We create meaning by pattern recognition, features of more familiar artifacts, and designers can act as their own arbiters to moderate the impact of temporal contextual conditions. The interaction between meaning and meaningful is not clear but there are indications that lack of meaning inhibits usability.

*"To explore an object is mainly about trying out its usability and thereby to judge it as meaningful or not. On the other hand, the interpretation of an object is about a continued search for meaning."* (Borjesson, 2007, p.10)

As argued by Chapman (2008) the concept of meaning is perhaps the most complex of all. As a relational property, meaning is influenced by the consumer's previous experiences, while also being highly context specific. For example, the meaning of a rat in a pet shop differs greatly

to that of a rat in a restaurant kitchen. In this respect it is easy to envisage how product meaning can be loosely steered by designers but never fully directed. However, meaning could be the designer's greatest opportunity to create individual, perceivably one-off experiences, within the peculiarity, the randomness and the idiosyncrasies of human emotion, design potential lurks, as it may be argued that emotional responses contribute to the very foundations of individuality. The example of the rat, though obscure, serves to demonstrate that meaning, expectation and memory are all interconnected components of psychological function that collectively serve to craft and form that specific character of any given human experience.

According to Mihaly (1990) meaning is a concept difficult to define, since any definition runs the risk of being circular. Its first usage points toward the end, purpose, significance of something, Mihaly gives the example of the question: What is the meaning of life? He then adds that this sense of the word reflects the assumption that events are linked to each other in terms of an ultimate goal and that there is a temporal order, a causal connection between them. It assumes that phenomena are not random, but fall into recognizable patterns directed by a final purpose. The second usage of the word, as stated by Mihaly (1990), refers to a person's intentions as an example we have the common: She usually means well. What this sense of meaning implies is that people reveal their purposes in action; that their goals are expressed in predictable, consistent, and orderly ways. Finally Mihaly (1990) states that the third sense in which the word is used refers to ordering information, as when one says: Otorhinolaryngology means the study of ear, nose, and throat, or Red sky in the evening means good weather in the morning. This sense of meaning points to the identity of different words, the relationship between events, and thus it helps to clarify, to establish order among unrelated or conflicting information. In line with Mihaly (1990) creating meaning involves bringing order to the contents of the mind by integrating our actions into a unified flow experience. People who find their lives meaningful usually have a goal that is challenging enough to take up all their energies, a goal that can give significance to their lives. We may refer to this process as achieving purpose.

Mihaly (1990) concludes by stating that an experience is meaningful when it is related positively to a person's goals. Life has meaning when we have a purpose that justifies our strivings, and when experience is ordered. To achieve this order in experience it is often necessary to posit some supernatural force, or providential plan, without which life might make no sense.

Mattelmaki (2006) argues that an object can be meaningful because it offers a link or prompts a recollection of a person, experience, story, place, feeling or atmosphere. It can be a particular item of memorabilia, or memory associated with it through a meaningful experience. Its design touches one. Its aesthetic and sensory quality evokes memories, or it ages and wears well. As such it presents a challenge to its user. This challenge can evoke both positive and negative feelings, and may involve an ambivalent love-hate relationship. The companionship involves loyalty, appreciation and confidence.

## **Sustainability**

According to the Brundtland Report (1987) sustainable development is the general development that meets the needs of the present without compromising the ability of future generations to meet their own needs. And it comprises two key concepts. First, the concept of needs. It also introduces the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

In that line of thought, Margolin (2014) argues that our ability to imagine a different future is essential to our capability of developing a sustainable culture.

Thompson (2013) adds that designing for sustainability has as a high priority the impact that a product or service will have upon the environment and the people, and it needs to be planned from production to end of life.

The IISD - International Institute for Sustainable Development (2013) adds that all definitions of sustainable development require that we see the world as a system that connects space and time. Because when we think of the world as a system instead of a space, we begin to understand that actions in one part of the world can have major negative effects on the other. And when we think of the world as a system over time, we realize that the decisions our grandparents made about how to farm the land continue to affect agricultural practices today and the economic policies we endorse today will have an impact on urban poverty when our children are adults. As such, we understand that quality of life is a system as well. The IISD goes on to add that even if we are physically healthy, there's still a chance we are poor or don't have access to education. Thus the concept of sustainable development is rooted in this sort of systems thinking. It helps us understand ourselves and our world. IISD concludes by establishing that the problems we face are complex and serious and we can't address them in the same way we created them. But there's room to address these problems.

According to Margolin (2014) action in solving these problems can occur at three distinct levels. The first is referenced as the micro-level which concerns individual actions, on this level we can include carbon footprint, home recycling, transportation (use of green vehicles such as bicycles) consumption of clean products, etc. The other level is referred to as the intermediate level and it concerns small groups of individuals in this category we can include institutions, schools, social networks and even universities. This level acts as a mediator between the micro and macro level because it is in this correlation that difficulties can occur when managing final products. According to Margolin, the best example of this level is the city where the scale allows it to be big but not as big as the macro-level and because of it it allows to test the efficiency of certain measures allowing conclusions to be drawn and perfected in a smaller scale. The macro-level includes governments, international organizations and big corporations that can reach the thousands or millions of employees.

According to Margolin (2014) throughout these levels there's a search for different approaches to the problem, the different approaches can compete with each other but only the best ones prevail. Therefore there are a variety of possibilities in which designers can act from the micro-level to the macro -level. As such in each one of the levels there's a place for designers, as individuals and as a group to prepare and generate new plans, proposals or suggestions. Margolin (2014) concludes by stating that when we consider the need for a sustainable economy and a waste effective solution, perhaps the biggest obstacle is public ignorance.

As such and according to Camargo (2014) the Organisation of the United Nations for Education Science and Culture (Unesco) asked that the education for sustainability to be in the commitment agenda of the Objectives of Social Development (OSD), that will be established by the UN in 2015.

In compliance with the Brundtland Report (1987) development involves a progressive transformation of economy and society. A development path that is sustainable in a physical sense could theoretically be pursued even in a rigid social and political setting. But physical sustainability cannot be secured unless development policies pay attention to such considerations as changes in access to resources and in the distribution of costs and benefits. Even the notion of physical sustainability implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation.

As stated in the Brundtland report (1987) a society may in many ways compromise its ability to meet the essential needs of its people in the future just by overexploiting resources, for example. The direction of technological developments may solve some immediate problems but lead to even greater ones. Large sections of the population may be marginalized by ill-considered development.

"Since the mainstream establishment of consumerism in the 1940s, numerous theories have been pioneered that attempt to generate coherent understanding of the immaterial factors that influence the uptake and subsequent disposal of manufactured objects. Many of which, attend to the socio-psychological dimensions of the user psyche, such as personality differences, status and desire." (Chapman, 2008, p.36)

" In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development; and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations...The satisfaction of human needs and aspirations is so obviously an objective of productive activity that it may appear redundant to assert its central role in the concept of sustainable development." (Brundtland Report, 1987)

As stated by the Brundtland report (1987) the principal development challenge is to meet the needs and aspirations of an expanding developing world population.

*"Concerns about environmental sustainability fall into two categories: the release of harmful substances into the natural environment as a result of human activity, and the exhaustion of the Earth's supply of resources as a result of over-extraction." (Allwood, 2016, p.1)*

## **1.1 Material**

Margolin (2014) states that humanity still has a lot to learn about how to coexist with nature.

In compliance with Thompson (2013) the choice of materials can cause a big impact upon the sustainability of a product or service.

Evidently, an industrial designer that aspires to ecological validation must forcefully take guidance in a new approach that doesn't consider an isolated object but considers it as a part of a complex system of interactions

(Bonsiepe, 1992, pp.84-85)

The sustainability topic can stick to the simple choosing of materials, but at the time of this selection we must consider the process of extraction, processing and refinement of materials because this stages can require large amounts of energy that may be pollutant. A good example of a low pollutant material is wood due to the fact that the material in a raw stage requires very little processing in order to obtain a product.

(Thompson, 2013)

*"The first step in any strategy to use sustainable materials is to reduce the demand for new materials." (tMcgee, 2013,p.1)*

According to Mcgee (2013) when designing a product we must select materials with low environmental impact. She further explains that a 'sustainable' material is one that does not impact negatively the natural environment or human health. She adds that when looking at the environmental impact of a material or product consider all stages of the life cycle — the upstream stage (materials extraction and manufacture), the in-use or operational stage, and the downstream stage (disposal or reuse).

She further describes Life cycle assessment (LCA) has a highly detailed scientific analysis that examines all the life cycle impacts of a product. It provides us with increasingly more comprehensive and useful assessments of the sustainability credentials of products and materials, allowing better and easier comparisons between products.

*"One of the most critical topics when designing sustainable products, is the life cycle of those products" (Thompson, 2013)*

*Reardon et al. (2013) states that most materials can be recycled. he further elaborates a list of recyclable materials:*

<i>Steel</i>	<i>Concrete</i>
<i>Aluminium</i>	<i>Glass</i>
<i>Plastics</i>	<i>Carpet</i>
<i>Timber</i>	<i>Bricks and tiles</i>

## National identity

Bauman (2004) states that the idea of identity and national identity in particular, did not gestate and incubate in human experience naturally, did not emerge out of that experience as a self evident fact of life. It congealed into a fact, a given, precisely because it had been a fiction, and thanks to the painfully felt gap which stretched between what that idea implied, insinuated or prompted, and the status quo ante (the state of affairs preceding, and innocent of, human intervention).

*"The idea of identity was born out of the crisis of belonging and out of the effort it triggered to bridge the gap between the 'ought' and the 'is' and to lift reality to the standards set by the idea - to remake the reality in the likeness of the idea."*

*(Bauman, 2004, p.20)*

Just as Bauman (2004) states that, longing for identity comes from the desire of security, which is by itself an ambiguous feeling. However exhilarating it may be in the short run, however full of promises and vague premonitions of an as yet untried experience, floating without support in a poorly defined space, in a stubbornly, vexingly betwixt-and-between location, becomes in the long run an unnerving and anxiety-prone condition. On the other hand, a fixed position amidst the infinity of possibilities is not an attractive prospect either. In our liquid modern times, when the free-floating, unencumbered individual is the popular hero, being fixed - being identified inflexibly and without retreat - gets increasingly bad press. And according to the civic model of nationhood, national identity is purely political; it is nothing but the individual's choice to belong to a community based on the association of like-minded individuals. The ethnic version on the contrary maintains that national identity is purely cultural. Identity is given at birth; it imposes itself on the individual

*"National identity was from the start, and remained for a long time, an agonistic notion and a battle cry" (Bauman, 2004, p.21)*

According to Bauman (2004) the main reason why the founders of modern sociology cannot answer the questions posited by our present plight is that if the problem of identity a hundred or more years ago was given shape by the operation of a *cuius regio, eius natio* principle<sup>1</sup>, today's identity problems stem, on the contrary, from the abandonment of that principle or from the half-heartedness of its application and the ineffectiveness of its promotion where such promotion is attempted. Once identity loses the social anchors that made it look natural, predetermined and non-negotiable, identification becomes ever more important for the individuals desperately seeking a *we* to which they may bid for access.

Mattoso (1998) further explains that when building a notion of collective identity it was found that in some cases cultural phenomena may have a greater influence on the formation of a national identity, in others the most decisive political events, in yet other countries may find it in

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<sup>1</sup> F.T: The region of the nation

economic or social factors. National diversity results, to a large extent, from the way in which the various constituent elements of its successive historical expressions are combined.

The last preliminary observation is based on the fact that national identity is not just a mental phenomenon. It always has an objective and it is almost inconceivable:

1) without some form of political expression, that is, without at any moment of history manifesting itself through the appropriation of a power endowed with a certain degree of autonomy (through some form of state);

2) without a given space pole and territory, even if that pole is transferred to another point and the borders of the territory vary over time;

(3) without political autonomy and its territorial scope continuing for a considerable period of time.

### **1.1 Portuguese identity**

According to Bauman (2004) because national identity doesn't come from fact of life, the fiction by it created was forced on to people's lives, fixed as a given that originated a tension that comes from the attempt to make the reality into the idea and not the other way around.

In compliance with Mattoso (1998) among the various possible ways of dealing with the problem of national identity, the one that seems to be simpler and more operational is the one based on the idea that the perception of national identity is the same type of perception linked to the identity of any other object, whether it is individual or collective.

Mattoso adds that based on social psychology expert Eric Erikson, to identify any object one must:

1) distinguish it from any other object;

2) give it meaning;

3) give it a value,

*"Na era da globalização (...) a nação continua ainda a ser uma forma preeminente de identificação. E, como ocorre em todas as formas de identificação, pertencer-se a uma nação implica partilhar referências a um passado comum - uma memória - e acreditar que esse colectivo possui características próprias: uma identidade." (SOBRAL, 2006, p.2):*

Mattoso (1998) states that when considering the case of Portuguese identity he found it of high importance to highlight the fact that national borders have remained virtually unchanged since 1297. This has made it possible to state that Portugal was the oldest country in Europe, not

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<sup>1</sup> F.T - "In the era of globalization ... the nation still remains a predominant form of identification. And, as in all forms of identification, belonging to a nation implies sharing references to a common past - a memory - and believing that this collectiveness has its own characteristics: an identity "

because of its power, even if it had been transmitted in a continuous line longer than that of any other European nation, but because its territory had been identical since the end of the thirteenth century, which was not the case with the other political formations of the old continent. Mattoso adds that most of the authors who have dealt with the national identity also attach great importance to the phenomenon of language, because Portuguese is speaking in a territory almost coincident with that of its political borders. There is no doubt that this fact is of historical importance.

Mattoso (1998) goes on to add that from the point of view of the subjects concerned, the consciousness of belonging to a given country is expressed through an idea that could be translated in the phrase - we are Portuguese; The others are foreigners - That is, I belong to a category of individuals that are characterized specifically by the common condition of being Portuguese and who are distinguished from all other men because they are not, and as such, they are foreigners. This awareness of belonging to a particular national category obviously implies that the characteristics of that category are known.

Mattoso (1998) concludes by stating that is undoubtedly obvious to most of the citizens who have already completed compulsory schooling and have completed military service, that is, those who have sufficient education to know what distinguishes the Portuguese people from foreigners. If at present this consciousness can be common knowledge of practically all the inhabitants of the national territory, it was not so in times in which there was no compulsory schooling for all people nor military service for all the young men. It is therefore perfectly plausible the anecdote that King D. Luis tells about when, well into the nineteenth century, he asked to some fishermen whom he met, if they were Portuguese. The answer was clear: "We others? No, my Lord! We are from Póvoa do Varzim! "Of course, if the fishermen of Póvoa do Varzim were able to respond to the king three hundred years after Camões had written and published *Os Lusíadas*, the unlikelihood of an identical situation would be much higher. Even after Afonso Henriques took the title of King of Portugal. The subdivision of medieval societies made the connection with the lord of the land and the village community prevail over any other kind of bond. The dependence on the king and his delegates was lived as a phenomenon of a completely different order from what the rights and duties of the citizens are today. The Portuguese Expansion, which put thousands of Portuguese in direct contact with other peoples and other civilizations, evidently strengthened national sentiment, from another lived experience. The others, with their physical characters and their customs, religions and languages so different, opposed, in their immense diversity, those who shared the common condition of people coming from the national territory. These differences showed what the Portuguese had in common.

The consciousness of national identity becomes generalized only after the dissemination of writing and the participation of the entire population in public life.

Mattoso (1998)



*"O nacionalismo (português) adquire no pensamento salazarista a importância de uma verdade revelada, ideologicamente estruturada da acção política. É nele e por ele que se enquadram as linhas de força de uma identidade portuguesa, e, concomitantemente, da praxis política do Estado Novo. O nacionalismo, motor da história de Portugal e do seu contributo para o mundo, surge, assim, como uma herança fatalmente a prosseguir: «Sem receio colocámos o nacionalismo português na base indestrutível do Estado Novo; primeiro, porque é o mais claro imperativo da nossa História; segundo, porque é inestimável factor de progresso e elevação social, terceiro, porque somos exemplo vivo de como o sentimento pátrio, pela acção exercida em todos os continentes, serviu de interesse à Humanidade [discurso de Salazar Discursos Políticos, vol. II]."* (Melo, 2001, p.46)<sup>2</sup>

Leal (2000) further explains it by stating that from the transformation in an ensemble of features, traits and objects taken from the original production context - rural life can function as representations of the national identity. Those objects that only we possess and others don't were convoluted symbols in which our national identity rests. In the portuguese popular culture, popular culture is always linked with rurality. Rurality is a non contemporary object seen as a testimony of the past that we have to reconstitute. Popular culture is seen almost exclusively for the literature and the popular traditions. Although seen in the present, literature and popular traditions are seen as an ethnic heritage that the people hold. The people are seen as the keeper of the anonymous texts of remote ethnic times. We can establish that traditional objects are the objects that we all know and can say where they came from in the country as they are globally recognisable as ours.

Muga (2008) adds that artisanal activity is the owner of specific characteristics; It is closely linked to economic, social, cultural, patrimonial and rustic aspects, despite losing to industry, it also manages to assert itself as a significant activity. In this way, craftsmanship is a manual production activity, assisted by common tools, which aims to satisfy daily necessities, both utilitarian and personal, as well as provide decorative objects for the home.

### **1.1.1 Handicrafts**

Mendes et al. (2015) states that there are productions that link us to a certain territory making it possible to identify it and make that particular territory and product unique. These are defined as non edible traditional productions, their singularity relays on the places they're develop in which influences the process of production and appearance of the products making them unique due to their roots and the history they hide. Therefore their singularity is not physical. It's isn't the territory characteristics that define the product it is the elements of

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<sup>2</sup> F.T - "Nationalism (Portuguese) acquired in the Salazarist mindset the importance of a revealed, ideologically structured truth of political action. It is in him (Salazar) and by him that the lines of force of a Portuguese identity are framed, and, at the same time, of the political praxis of the Estado Novo - New state. Nationalism, the motor of the history of Portugal and its contribution to the world, thus appears as an inheritance inevitably to continue: "Without fear we have placed Portuguese nationalism on the indestructible base of the New State; First, because it is the clearest imperative of our History; Secondly, because it is an inestimable factor of progress and social elevation, third, because we are a living example of how the country feels, through action on all continents, has served humanity's interest [Salazar's speech Political Discourses, Vol. II]."

local culture that will determine the significance and history represented by the product and it is that significance that embodies the meaning of the product. This significance is known by the know how in-puted by the locals and these have been transmitted throughout generations in order to teach next generations the significance and history of a local culture or tradition. This is the heritage of a certain region and therefore it must be passed on. These products become important to different regions of a country and therefore are commonly represented in a map, it's the ensemble of those traditions that makes the Portuguese culture as a whole.

*"Mesmo no artesanato tradicional, ao reproduzir formas e padrões de carácter secular, o artesão não deixa de marcar, com a sua criatividade, a singularidade da obra que produz."* (Sousa & Campos, 1989, p.11).<sup>3</sup>

According to Mendes et al., (2015) in Portugal the best known traditions are pottery and textiles that have interpretations in different regions of the country each interpretation constitutes the identity of a region. These two traditions have become important due to their direct link with the daily life of the communities as well as their habits and needs.

Sousa (2015) goes on to describe the crafts of each Portuguese region commencing with the north. Sousa states that the northern crafts include the famous Rooster of Barcelos (fig. 9 on the right), the painted ceramics with bright colors, the boats made of shells and sweatshirts made in Pova de Varzim, the Tracery of Bilros from Vila do Conde and handkerchiefs of Minho commonly known as *namorados* handkerchiefs (fig.10 on the right) . In Trás-os-Montes, embroidery stands out due to the thorough work and resources, linen looms, the tableware of Bisalhães, black pottery, the Bagpipes of Miranda do Douro and the Iberian masks, such as the ones from Ousilhão and Lazarim. Coimbra is an important center of pottery ever since the seventeenth century, because of its typical earthenware decorated in shades of brown, blue and purple. The central region is also famous for weaving, as the blankets of Sardoal, basketry and metalwork. In Ribatejo, the Campino culture influences the existence of leather crafts, see fig.11. Coruche, is known for silk embroidered coats made for the knights. Further south, the Alentejo and Algarve region offer crafted cork and painted furniture with floral motifs. Clay dishes painted and glazed are one of the most common objects in the region.

According to Sousa (2015) the Azorean crafts commonly use wood, fish scales, bones and whale teeth, basalt, clay and corn leaves as raw materials. Known as well for ts famously colorful pottery from Lagoa and objects made in whale bone<sup>1</sup> from Pico and Faial. And in Madeira, the most well known products are handmade embroidery which combines floral motifs and geometric figures, tapestries and wicker basketry.

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<sup>3</sup> F.T - "Even in traditional craftsmanship, when reproducing forms and patterns of secular character, the artisan does not fail to mark, with his creativity, the singularity of the work he produces"



fig. 9 Barcelos' Rooster  
Source: Costa, Miguel - Galo de Barcelos, cm-barcelos, 2015.  
[Access. 13th Dec. 2015].

Available in: <http://www.cm-barcelos.pt/visitar-barcelos/artesanato/GalodeBarcelos.JPG/@@images/image/preview>



fig. 10 Namorados handkerchiefs  
Source: Namorar Portugal, Os lenços de Namorados, Vila Verde.  
[Access. 13th Dec. 2015].

Available in: <http://www.namorarportugal.pt/pt/conteudos/conteudo/id/168>



fig. 11 Campino's Costume  
Source: MONTEIRO, Carlos, (1993), © DGPC, Lavrador ribatejano, Matrixpix, 2015.  
[Access. 13th Dec. 2015].

Available in: <http://www.matrixpix.dgpc.pt/MatrixPix/Fotografias/FotografiasConsultar.aspx?TIPOPESQ=2&NUMPAG=10&REG-PAG=50&CRITERIO=traje&IDFO-TO=38040>

### 1.1.1.1 Textiles

Sousa (2015) states that Portuguese weaving is often associated with embroidery. Linen, for example, was a material widely used in everyday life of the Portuguese in rural areas, and because of the high level of usage a type of cloth known as *Bragal* emerged. The *Bragal* is a pure linen fabric, which is still spun and woven in Tras-os-Montes region. Drawings can be formed on the linen during weaving, but they are also used to make traditional embroidered in relief of the parishes of Limões and Cerva.

Tracery and embroidery are very deep rooted arts in Portugal. The *Bilros'* tracery seen in fig.12, is known in fishing areas, and requires a lot of work, accuracy and patience from the tracery makers that work to weave delicate motifs and pieces of great beauty. Vila do Conde holds the Museum of *Bilros'* tracery. Colorful and very elaborate the embroideries of Viana do Castelo are also very well known and very common in traditional costumes of the region. Equally famous are the embroidered quilts in Castelo Branco made of silk thread, and inspired by motifs such as hearts, birds, carnations, roses and lilies. Embroidery of the Madeira region is used in table cloths, quilts towels.



fig. 12 Bilros' tracery  
Source: Rendas de Bilros de Vila do Conde ©,  
2011.[Access. 13th Dec. 2015].

Available in: <http://www.rendasdebilros.com/>

### 1.1.1.2 Earthenware

Sousa (2015) characterises Portugal as having a very creative tradition in earthenware, this tradition is represented by portuguese brands like Vista Alegre and the artistic earthenware factory of Bordallo Pinheiro, the likes of his work can be seen in fig.13. The last 125 years of portuguese earthenware history and the name comes from its founder Rafael Bordallo Pinheiro. This factory is located Caldas da Rainha, in the center of the country, this is an area well known for having a large concentration of factories and craftsmen that work in this secular tradition. Other objects included in this craftsmanship include nativity scenes, Religious statues, decorative miniatures and dishes painted with traditional motifs.



fig. 13 Bordallo Pinheiro's tableware  
Source: Bordallo Pinheiro ©, 2015, Couve.  
[Access. 13th Dec. 2015].

Available in: <http://pt.bordallopinheiro.com/mesa-couve-cat>

### 1.1.1.3 Jewelry

Sousa (2015) describes Portuguese jewelry as rich in details and meaning. After the Discoveries period, the Portuguese royalty began to bring their overseas possessions stones and precious metals such as gold from Brazil, Angola diamond and other valuable assets. These materials were used by goldsmiths in jewelry and sacred art pieces, like the magnificent traditional custodians .

A portuguese ancient technique, the filigree is characterised as the of handle gold and silver in a fine tracery. The main figures are crucifixes, Maltese crosses, symbols of the sea, nature, religion and love, as the famous heart of Viana, used as a pendant or earrings example of such exquisite work is seen in fig.14.



fig. 14 Portuguese jewelry  
Source: Tradição Portuguesa, Filigrana Portuguesa. [Access. 13th Dec. 2015].

Available in: <http://tradicaoportuguesa.pt/artesanato/joalheria-portuguesa/filigrana-portuguesa/>

#### **1.1.1.4 Basketry**

##### **1.1.1.4.1 History**

*In A senhora do monte* (2013) it's stated that by using indigenous tree species, the thick basketry found its usefulness in the Portuguese agricultural region in the performing of daily tasks, in particular harvesting in which baskets are made of wicker. Basketry, whose origin in Portugal goes back at least to the Celtic culture, remains today, an indispensable activity in the economy of rural and domestic life. In northern Portugal, basketry is represented by a multitude of objects, with different formats and shapes, executed in reed, straw, wood and wicker, according to various techniques it also can be intended for different uses, from rural works to transport shopping .

The baskets, intended for rude service of farming, fishing and trade, are made with cracked wood strips, drawn up on the bench and recessed. For cleaner services baskets are made with linters - of osier and willow, which they cracked, these are mainly used as sewing tools' basket, and the gypsy basket, very popular among street saleswomen, in which they carry fruit, fish, and vegetables or trinkets. Basketry as a whole is understood as a set of objects or utensils, obtained by twisted raw materials or plant fibers. The basketry includes the manufacturing of mats as well as the coating or cover of objects. In this sense basketry comprises the manufacturing technique of baskets or containers of two fundamental types:

interlace type, encompassing the cross genres, piped, rolled and twisted, as a way to arrange the fibers, and the spiral type, with or without support frame. The baskets can be made from different materials, such as: cracked wood, wicker or willow switch

reed, straw, bamboo cane, Indian cane, willow tree, chestnut, cherry and paper. As for purpose it can go from intended for firewood or grapes to baskets of various dimensions and decorative objects as well.

*in A senhora do monte*, (2013)

##### **1.1.1.4.2 Origin**

We found that basketry has different origins below are the most well known origins:

Indian origin - in the manufacture of baskets to carry objects or stockpiles of food, to marketing, the Indians began to make bracelets, necklaces, fishing traps and more.

Nomadic origin - Basketry originated in the nomadic peoples in the search for storage solutions and transportation and food in antiquity.

Persian origin - Some shields were made of wickerwork used in Persian battalion of the immortals.

Iberian origin - Others say S. Gonçalo village was the cradle of basketry in Portugal and Spain.

*in A senhora do monte*, (2013)

As such and according to Hoffman (2012) we found that wicker is one of the oldest methods of making furniture, and has been a common practice all over the world for thousands of years. Wicker is the term for the product of weaving any number of natural materials, including rattan, cane, willow and raffia, among other plant fibers. The material is typically cut into strips of proper width, dried, then soaked in water to make it flexible before it is woven into wicker. So in other words, wicker can refer to anything that's woven, while, say, rattan refers to anything made specifically from the rattan plant. Wicker is also an ancient craft that was initially developed as basket weaving. Delicately woven rush or reed furniture was buried with pharaohs in ancient Egypt, including Tutankhamen (ca. 1341-1323 BC), who was buried with several examples of wicker, from a chair seat to a headboard to a stool. The Romans were inspired by Egyptian woven furniture, and adopted wicker as their own furniture technique, spreading the style across their empire.



fig. 15 Wicker in the 17th century  
Source: Apartment therapy, 17th century wicker  
[Access. 13th April, 2016].

Available in: <http://www.apartmenttherapy.com/wicker-furniture-quick-history-121303>

By the 17th century in Northern Europe, wicker began to look much like it does today. In Holland, wicker was considered particularly appropriate for baby-related furniture, including cribs, bassinets and low-slung nursing chairs. It was also used for high-backed or hooded chairs favored by the sick and elderly. Wicker was considered a healthful material, more breathable and comfortable than solid wood, and more hygienic than upholstery. It didn't hurt that wicker was also cheap, natural fibers being an inexpensive alternative to timber. Hoffman adds that during the next couple of centuries, the rise of trade with Asia brought rattan to the West, introducing a stronger material that lent itself to wicker work. Imperialism also contributed to a new perception of wicker as exotic and Eastern, since European colonists encountered the technique in Southeast Asia. Rattan wicker was an ideal material for tropical locales, since it wouldn't warp or crack in heat and humidity. Wicker furniture soon spread across the British Empire, from India to the West Indies, and to England itself, where it was associated with a safely civilized exoticism that captivated the Victorians. As the 19th century wore on, however, wicker became domesticated, its flexibility a perfect match for the curlicued fussiness of Victorian tastes.

Hoffman (2012) states that the Modern era became interested in wicker and cane furniture as a hygienic and simple alternative to upholstery. It was around this time that an American company invented synthetic wicker, further increasing the durability and weather- and pest-resistance of the material.

### 1.1.1.4.3 Wicker

According to Bairos (2012) there are two systems to farm wicker. One is in marginal areas of the property, where there is no tillage and cultural transactions are sporadic brushstrokes. In the second system, there are systematized plantations in drained floodplains. Planting should be done in November, December, when there is more rain, with the use of stakes collected. The canes of wicker are dipped up to the depth of 15 to 20 centimeters, spacing 70 to 80 centimeters between rows and plants.



fig. 16 Drying wicker  
Source: Telmo Pereira, Vime a secar  
[Access. 13th Nov. 2015].

Available in: <http://www.telmopereira.com/Vimes.html>

Bairos (2012) goes on to explain each step of the process beginning with pruning which is usually done in February, sometimes extending to March. In order for the wicker to have a longer shelf life, the cut must be done in the waning of the stalks (small branches of the plant). Cut with the help of scissors. The process of getting into the hands of the craftsman, is long and requires a hard work. After pruning, there are two types of treatment to which the wickers are subjected, depending on whether they should be worked raw or cooked. Bairos continues by explaining that once cut, the wicker is separated by size, tied in smaller groups and placed inside a boiler with water, where it will be cooked for a few hours. After cooking, the peel is removed from the wicker and exposed to the sun until well dried. Bairos concludes by explaining that the processed wicker should be stored in a dry and well-ventilated place.



#### 1.1.1.4.4 By areas

##### S. Gonçalo

A place very well known for basketry, is commonly stated that everyone in S.Gonçalo knows how to make a basket it was one of the most important sites of basketry in Portugal most commonly using wicker or willow. S. Gonçalo hold the monopoly of basketry for long years but in the early seventies began to lose terrain to Madeira's basketry which was cheaper and very similar to S.Gonçalo's basketry. The social agitation in that period (25'th april 1974 - commonly known as Revolução dos Cravos) didn't help dissolve the crisis that only increased to this day. (Correia et al., 2013)

Alves (2002) makes reference to António Cardoso, an historian native of Gonçalo, that explains that basketry "is not an invention of the Gonçalenses" and that this activity was born from the need that people had in storing and transporting food. This need goes back to the Romans who, in that area, explored tin and lead. The basketry also worked as a complement to agriculture, so the baskets were not sold. However, from 1810, António Cardoso explained that basketry became a profession, and Gonçalo reached its peak in the commercialization of baskets in 1960. At the time there were two companies that housed about a hundred workers each. Alves (2002) carries on by stating that from then on basketry went into decay, the companies closed and the basket-makers are less and less easily found.



fig. 17 S. Gonçalo's basketry  
Source: Gonçalo - Guarda Capital da Cestaria, 2015,  
[Access. 13th Dec. 2015].

Available in: <https://www.fabook.com/151460198205221/photospb.151460198205221.-2207520000.1452206746./962307853787114/?type=3&theater>

## Madeira

Famous for mastering the art of basketry it has become known for the intricacy and mastery of numerous decorative designs that contaminated every room in the house from the kitchen to the bedroom. This type of work influenced the region of Camacha the most where 90% of the population worked in basketry in the 80's nowadays only 5% remains. Here basketry remains frozen in time. (Correia et al., 2013)

According to Correia (2013) Handmade wickerwork began around 1850 on the island of Madeira, in the parish of Camacha, although handcrafted wicker basketry is made in smaller scale all over the main island. Correia further explains that the climate of the Madeira islands, combined with soil conditions (humid and fresh), and water abundance, makes the island of Madeira have a wicker production of great quality. Each plant can produce between 2 and 5 kg of wicker, with different diameters. As such, the wicker culture spread all over the island, although at present few are those who still make wicker their source of income.



fig. 18 Madeira's basketry  
Source: Madeira-live, 2012.  
[Access. 13th Dec. 2015].

Available in: [http://www.madeira-a-z.com/uploads/pics/Korbflechtere\\_i\\_Camacha/](http://www.madeira-a-z.com/uploads/pics/Korbflechtere_i_Camacha/)

## Algarve

Known for the cane basketry in which the material allows different objects to be made with very different appearances.

(Correia et al., 2013)

In compliance with Costa (2009) in the Algarve area basketry is made by using either wicker or palm tree the latter is the most popular one and is more commonly known as "Empreita". This is an activity that has already been responsible for the income of several artisanal families in the Barrocal Algarve, nowadays, despite still being a type of representative craftsmanship, it no longer has the importance that once it had. This type of handicraft was traditionally a type of work carried out mainly by women, when there was no work left in the fields.

Costa (2009) further explains that "Empreita" results in a plaited ribbon made with the leaves of the palm that is found in the region, and with it several diverse objects are made. Initially this raw material came from the interior of the Algarve, it grew in the bushes of the Barrocal area. Later due to the scarcity of this plant, it began to be imported from the south of Spain.



fig. 19 Algarve's basketry

Source: BAPTISTA, Patricia , 2013, Cestaria  
[Access. 13th Dec. 2015].

Available in: <http://aimericoalgarve.blogspot.pt/2013/02/cestaria.html>

## User-Centered Design and the Pre-adolescent Child

### User-Centered Design

According to Mattelmäki (2006) user-centered design creates an interaction with the users from the start, and this interaction is maintained all through the iterative process. The goal is to introduce an understanding of the user's needs into design work, and transfer it into the product specifications. The user's view is also utilised in the evaluation of the design solutions. Standards such as ISO 13407 (fig. 20), define the process of human-centred design. Firstly, it identifies the need for design, secondly it determines the context of use and produces the user requirements, and then start designing solutions. The work concludes with evaluation and iteration of the solutions until they meet the requirements. However, creative iterative design enables the integration of the user study activities into all the stages of the process in a more dialogical way than the ISO standard. The research can initially resemble a journey of exploration: what is over the ocean, India, America, or some other end of the world? The direction is taken first, and the destination is adjusted on the way there. Traditional methods include market analysis, group discussions, inquiries and interviews, which typically produce knowledge of large masses of people, and result in figures, statistics and tables.

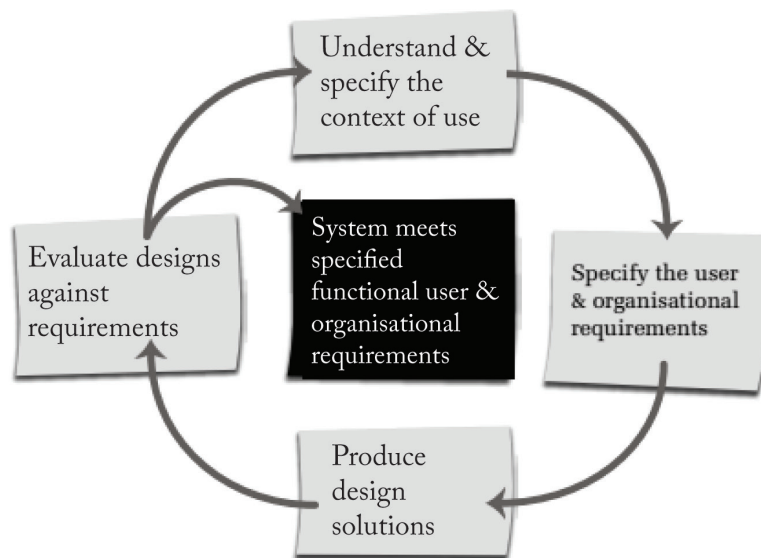


fig.20 ISO 13407 /Standard of Human-Centered Design  
Source: MATTELMÄKI, Tulli. (2006). Design Probes. Publication Series of the University of Art and Design Helsinki A 69.  
ISBN: 951-558-212-1

*"(...)it is now becoming apparent that the user-centered design approach cannot address the scale or the complexity of the challenges we face today. We are no longer simply designing products for users. We are designing for the future experiences of people, communities and cultures who now are connected and informed in ways that were unimaginable even 10 years ago."*

*(Sanders & Stappers, 2008, p.6)*

According to Userfocus (2015) User-centered design stands as the only design methodology that puts users in the center of the design process. Because of it Userfocus determines that it is therefore an ideally suited method to develop products that must be simple and of a straightforward use. Their approach to User-centered Design follows three principles in all of User-Centered Design projects:

. Early and continual focus on users and their tasks - Determines that we must understand our users and what they want to do. This understanding was achieved by their direct study of the users behaviour and attitudes.

. Empirical measurement of user behaviour - Early in the development process, determines that users should actually use simulations and prototypes to carry out real tasks, and their performance and reactions should be observed, recorded and analysed.

. Iterative design - Establishes that when problems are found in user testing (as they will most likely be) they must be fixed. This means design must be iterative: there must be a cycle of design, test and measure, and redesign, repeated until the usability objectives are met.

Earthy & Sherwood Jones (2010) developed the following lists that intend to summarize the collective requirements of ISO 26800:2011 that intends to bring together in one document the basic principles and concepts of ergonomics and ISO 9241-210:2009 that provides requirements and recommendations for UCD principles and activities throughout the life cycle of interactive systems. As such based on both standards Earthy & Sherwood Jones, determined that the fundamental principles of ergonomics and UCD:

1. Ensure the project understands what the users want or need to achieve and the environment in which they work or live.
2. Ensure the designers know who the users are and how the system should fit into their lives or their work.
3. Make the demonstration of usability (in the broad sense of quality in use) the objective of the design team.
4. Have a flexible team that can understand and address all aspects of the user's experience with the system.

Regarding required project activities UCD methods:

5. Facilitate a focus on usability from the very beginning of the project.
6. Help the users to develop a clear understanding of their actual requirements.
7. Set targets for user interaction and performance with the system.

8. Ensure that the team takes account of relevant ergonomics knowledge and the users' requirements.
9. Ensure that quality in use is an early and continued target for the designers.
10. Select and provide methods and tools suitable for doing HCD work on the project.
11. Make sure UCD work is done and that the results are used.
12. Make sure the findings from UCD work, and their impact, is communicated to all the right people.

Required organizational management activities:

13. Include and integrate UCD into the overall project plan and all phases of the product life cycle.
14. Integrate milestones for human centered activities into the overall design and development process.
15. Allocate time for iteration and the incorporation of user feedback, and for evaluating whether the design solution satisfies the user's requirements
16. Involve workers or users (or potential workers or users) in the process.
17. Identify the range of skills and viewpoints required in the team in addition to the staff, public, and other users
18. Define the responsibility for achieving each of the above objectives and allocate sufficient authority to fulfill these responsibilities.

*"User-centered design is intended to understand who the users are, what they do, and what kinds of attitudes and properties they have." (Mattelmaki, 2006, p.61)*

### **1.1 Child centered Design**

*" I believe that children can and should be partners throughout a team research experience. Just as computer scientists or educators may be limited in their range of experience, so too are children. But each has their own expertise to contribute depending on what the team needs are during the research and development process."*

*(Druin, 1999, p.1)*

According to Idler 2013 User-Centered Design (UCD) is an approach to design that grounds the process in information about the people who will use the product. UCD processes focus on users through the planning, design and development of a product.

In the eyes of Idler the concept of user-centered design has gained wide popularity, however she underlines a major limitation: 'Users' are not considered to include children. Children are different from adults and Idler believes that doesn't make them a less important target group. Neither does it justify ignoring children when designing products for them. She understands that we should take what we have learned from UCD and apply it to kids instead. What we get then is a more appropriate methodology named child-centered design (CCD) – a perfectly justified field by her own standards.

The Usability Professional's Association (UPA) has identified four key activities that make up the user centered design process. Idler uses the model in fig.21 and specifies 'human' as 'children'.

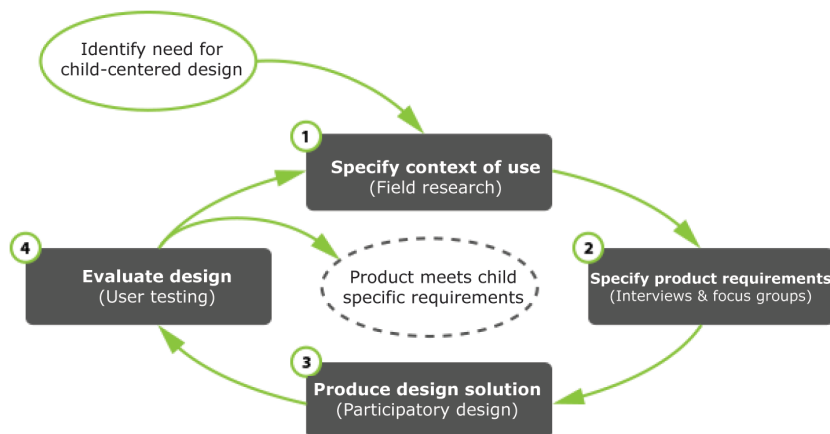


fig.21 Child-Centered Design Model  
Source: IDLER, Sabina. 2013. Child-Centered Design is User-Centered Design, But Then Different. [On line]. [Access. 10th March.2016].

Available in: <http://uxkids.com/blog/child-centered-design-is-user-centered-design-but-then-different/>

In that line of thought Branton (2003) provides a complementary view by adding that first hand experience is best and further explains it by expressing that the only way to develop the fundamental understanding of how children perceive the world is by spending time with children of the age group you're designing for, by observing and playing with them.

Branton elaborates by stating that whilst observing children playing can be useful in order to design more appropriately for them, we must recognise that this is limited by the form factor and functionality for a completely different age group and purpose. Watching children interact with objects they use in traditional play provides far more inspiration.

She goes on to add that real innovation happens when people move beyond existing beliefs and limitations. And elaborates by stating that Designers making products for children need to move away from the

limitations of national curriculum guidelines and existing pedagogical methodologies in order to embrace exciting new learning opportunities. Future learning products for children need to support their natural desire to explore and discover, make their own connections and find their own “learning” paths, allowing them to be part of developing future ways of learning.

Idler (2013) elaborates on the topic by concluding that we ultimately need to identify and accept the need for child centered design. And acknowledges that once we have the right mindset, it’s becomes easy to follow the steps that she identified:

#### 1. Specify the context of use

Start with identifying the “people who will use your product, what they will use it for, and under what conditions they will use it”. In case of CCD, these people are children. In order to truly understand the context of use, you might have to go out there and do some field research. Talk to parents, teachers, and other adults that can tell you about children habits. Then take the time to observe kids in their own environment to find out how they act, what they do, and what matters to them.

#### 2. Specify requirements

Once you know who will use your product and in what context, it’s time to get to know your target age group. Depending on the age, you can either observe them or engage them in a conversation to get more specific insights.

When designing for children, keep in mind that there are several stakeholders involved with different interests. Make sure you cater to all of those interests without losing sight of your users.

Requirements include both “business requirements”, and user goals that must be met for the product to be successful.

#### 3. Create Design solutions

Based on all the insights you gained from your context analysis and considering your product requirements, you can go ahead and create your design solutions. Don’t worry if you are not 100% satisfied after your first draft – this part of the process “may be done in stages, building from a rough concept to a complete design”. Participatory design is a great way to involve kids in this part of the process. Their unbiased creativity can be very liberating, helping you to look past your familiar patterns and best practices.

#### 4. Evaluate designs

Now it’s time to evaluate your design – ideally through user testing your target audience. In this case, there is no way around getting together with your target group to find out if there are any unexpected issues. When designing for children, it is not only important that your product



is easy to use for your target age group, it also has to be fun and engaging. While adults are often driven by an intrinsic motivation, kids usually need extrinsic factors in order to even use your product.

### **1.1.1 The pre adolescent child**

According to Crawford & Goti (2013), pre-Adolescence is a stage of human development that follows early childhood and prior to adolescence. It generally ends with the beginning of puberty, but may also be defined as ending with the start of the teenage years.

In compliance with the Institute for Human Services for The Ohio Child Welfare Training (2007) we can understand the development of a pre-adolescent child by assessing their development in categories as emotional behaviour, cognitive development and social skills. As such, the Institute further explains that within the preadolescent phase we can characterize the individual according to the given categories:

#### ***Emotional:***

- .Self-esteem based on ability to perform and produce;
- .Develops alternative strategies for dealing with frustration and expressing emotions;
- .Sensitive to other's opinions about themselves;

#### ***Cognitive:***

- .Use language as a communication tool;
  - .In terms of perspective taking 10 to 11 years old can accurately recognize and consider others' viewpoints.
- In terms of concrete operations they hold:
- .Accurate perception of events;
  - .Rational, logical thought; concrete thinking; reflect upon self and attributes; understand concepts of space, time and dimension;
  - .Can remember events from months, or years earlier;
  - .Develop more effective coping skills;
  - .Understand how their behavior affects others;

#### ***Social:***

- .Friendships are situation specific;
- .Understand concepts of right and wrong;

.Rules relied upon to guide behavior and play, and provide child with structure and security;

.Begin understanding social roles; regards them as inflexible; can adapt behavior to fit different situations; practices social roles;

.Takes on more responsibilities at home;

.Less fantasy play, more team sports, board games;

.In terms of morality they avoid punishment and are self interested in exchanges.

In that line of thought Family issues (2003) further defines the pre adolescent years as being part of the 5th stage of development according to the stages of life from birth to death. As such responding to an internal developmental clock or organizational patterns of growth that prescribe the tasks and skills they need to learn.

Levin (1982), describes these shared patterns of growth as part of the primitive forms we carry deep in our ancestral memory and defines them according to the model in fig.21

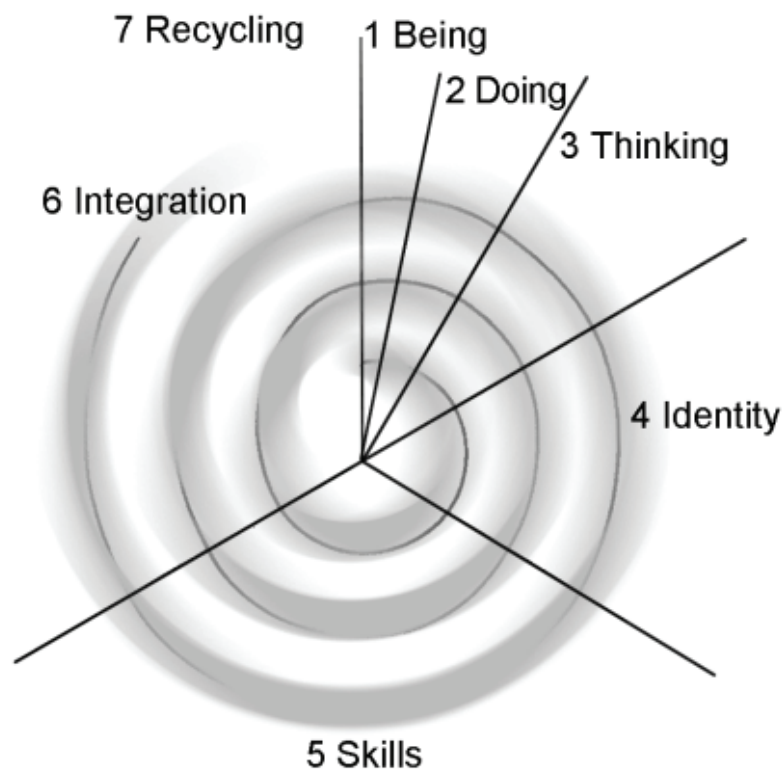


fig.21 Child development cycle  
Source: LEVIN, P. (1982). The cycle of development. Transactional Analysis Journal, 12, 2, 136-137. Eliot, T. S. (1942). Little Gidding.

Family issues further explains stage five as the period of life that lasts for six years and encompasses the preadolescence ages. Within this stage (which according to family issues we can revisit any time during adulthood) we are acquiring the skills, tools and values we need to get by in the world. Family issues also defines the period as responsible for the installation of an internal framework, where we incorporate a whole range of opinions and values in order to perceive the world in a structured, coherent way.

In Stage Five we need to decide that it's okay to learn how to do things our own way and to have our own morals and methods.

Within this stage family issues defines main questions to be addressed by kids such as:

.How do I build an internal structure that supports me, as well as others?

.How do I develop the competence to master the technical and social skills?

.I need to manage my own life and to live in my culture?

By asking this questions family issues understands that kids need to do so in order to ultimately learn skills, learn from mistakes and decide to be adequate. To also learn to listen in order to collect information and think. To also practice thinking and doing and to reason about wants and needs. To check out family/caregiver rules, ideas and values, and learn about structures and people outside the immediate family or familial structure. To experience the consequences of breaking rules in order to develop internal controls. To disagree with others and still be loved. To learn what is their responsibility and what is the responsibility of others and ultimately to develop the capacity to cooperate.

## **Design Process**

According to Sanders & Stappers (2014) today's design encompasses many activities that traditionally were not considered part of designing. A traditional product design project usually begins with a brief and a list of requirements. These days many additional activities have become considered to be a part of design as well, these activities are generally to determine requirements traditionally known as research, to set general directions can be referred to as strategy, to evaluate design like usability testing), and to observe in the field on earlier product usage situations or how a product is used after it has been released into the world.

When Sanders & Stappers (2014) laid them out along a timeline, they define four main phases, as shown in Figure 21. The first black dot indicates the point at which the design opportunity has been established. The second black dot indicates the point at which the thing that is designed is put to use. Toolkits and probes are usually used in the early front end of the design process. Prototypes are usually put into action once the design opportunity has been established.

The names of the phases which form the headings across the top of Figure 22 also indicate the types of design research relevant at each phase. Figure 22 also introduces pre-design as research that occurs before the generative phase and post-design as research that takes place after the design is produced. Pre-design research focuses on the larger context of experience while post-design research looks at how people actually experience the product, service or space. Generative design research leads up to the design opportunity decision, and evaluative research takes place during the subsequent design development process. The latter is labelled evaluative since the main concept is known and the prototypes serve as instantiations which provide the means for evaluation and subsequent refinement.

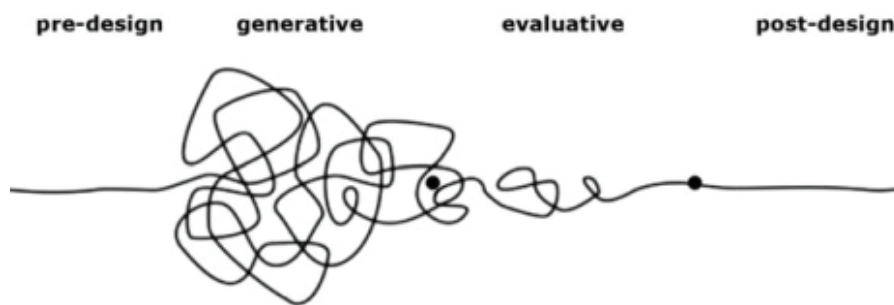


fig.22 Design process timeline  
 Source: SANDERS, Elizabeth ; STAPPERS, Pieter Jan (2014).  
 Probes, toolkits and prototypes: three approaches to making in codesigning, CoDesign [On line]. [Access. 17th October.2015].

Available in: <http://dx.doi.org/10.1080/15710882.2014.888183>.

Table 1 compares pre-design, generative, evaluative and post-design research phases across a number of descriptive dimensions.  
 (Sanders & Stappers, 2014)

Design research	Pre-design and post-design	Generative	Evaluative
Purpose	To understand people's experiences in the context of their lives: past, present and future dreams	To produce ideas, insights and concepts that may then be designed and developed	To assess, formatively or summatively, the effect or the effectiveness of products, spaces, systems or services
Results	To prepare people to participate in codesigning Empathy with people Creative codesigners	What will be useful? Usable? Desirable? Opportunities for future scenarios of use Exploration of the design space	Is it useful? Usable? Desirable? Identification of problems Measurement of effectiveness
Orientation	Past, present and future	Future	Present and near future

tab. 1 Comparison table of the research phases  
 Source: Adapted by the author from: SANDERS, Elizabeth ; STAPPERS, Pieter Jan (2014).  
 Probes, toolkits and prototypes: three approaches to making in codesigning, CoDesign [On line]. [Access. 17th October.2015].

Available in: <http://dx.doi.org/10.1080/15710882.2014.888183>.

## 2.1 Tools and techniques

According to Sanders and Stappers (2008) in user studies projective methods are used for collecting qualitative data about the users and their values, dreams, needs, understanding and inspiration, and for further development of design, not for finding out about psychological problems. This type of innovative methods typically produce visual and verbal knowledge for delineating and discovering design opportunities. For example in participatory design workshops the user's reflections and ideas are conveyed straight to the designers through visual methods. Firstly, the methods should be creatively worked out to match any given situation. Secondly, designers can smoothly elaborate their research findings into design solutions. Probes and generative toolkits are two prominent approaches in the practice as they are both design-led approaches as described by the landscape of design research and practice (Sanders and Stappers 2008), as reproduced in Figure 23. Figure 23. The map of design research, showing different approaches laid along two axes: role of the user (horizontal), and approach of the research (vertical).

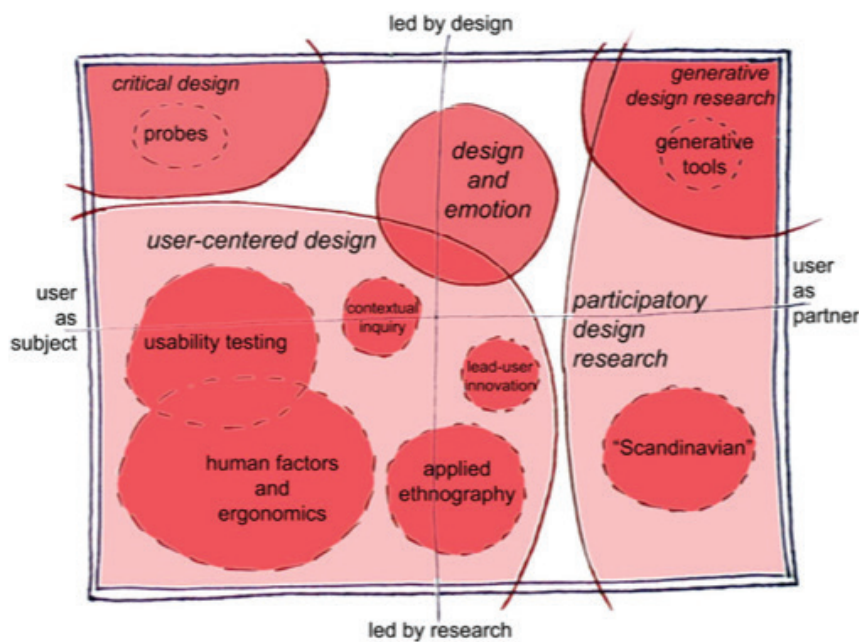


fig.23 Current state of User-Centered Design

Source: SANDERS, Elizabeth ; STAPPERS, Pieter Jan - Co-creation and the new landscapes of design - pre print [On line]. [Consult. 10th January.2015].

Available in: [http://www.maketools.com/articles-papers/CoCreation\\_Sanders\\_Stappers\\_08\\_pre-print.pdf](http://www.maketools.com/articles-papers/CoCreation_Sanders_Stappers_08_pre-print.pdf)

Table 2. (next page) represents a comparison of the three approaches to making.compares generative toolkits, probes and prototypes across a number of descriptive dimensions.

Sanders and Stappers (2014)

The three areas of probes, generative toolkits, and prototyping, and suggesting their places in the design process are shown in Figure 24 (next page) and they were developed by Sanders and Stappers (2014) as well as the revised framework of Figure 22 (fig.25 page 62) which

	Probes	Toolkits	Prototypes
What is made?	Probes are materials that have been designed to provoke or elicit response. For example, a postcard without a message.	Toolkits (made up of a variety of components) are specifically confirmed for each project/domain. People use the toolkit components to make artefacts about or for the future.	Prototypes are physical manifestations of ideas or concepts. They range from rough (giving the overall idea only) to finished (resembling the actual end result).
Why?	Designers find inspiration in users' reactions to their suggestions.	To give non-designers a means with which to participate as codesigners in the design process.	To give form to an idea, and to explore technical and social feasibility.
What is it made out of?	Probes can take on a wide variety of forms such as diaries, workbooks, cameras with instructions, games, etc.	Toolkits are made of 2D or 3D components such as pictures, words, phrases, blocks, shapes, buttons, pipe cleaners, wires, etc.	Prototypes can be made from a very wide array of materials including clay, foam, wood, plastic, simple digital and electronic elements.
Who conceives?	Designers create the probes and send them to end-users and other stakeholders, often with little or no guidance of how the end-users should treat them.	Designers and researchers make the toolkits and give them to others to use to make artefacts. The process is often facilitated or guided.	Codesigners create the prototypes to envision their ideas and to display and to get feedback on these ideas from other stakeholders.
Who uses?	End-users and other stakeholders individually complete the probes, returning them to the person who sent them out.	End-users and other stakeholders use them to make artefacts about or for the future. Toolkits work with both individuals and small groups..	Designers use the prototypes as design tools. End-users may use the prototypes during evaluative research events.

tab.2 Comparison of the three approaches to making  
Source: Adapted by the author from: SANDERS, Elizabeth ; STAPPERS, Pieter Jan (2014). Probes, toolkits and prototypes: three approaches to making in codesigning, CoDesign [On line]. [Access. 17th October.2015].

Available in: <http://dx.doi.org/10.1080/15710882.2014.888183>.

is a more explicit about the relationship between probes, toolkits and prototypes within the design process. It also introduces two distinct mindsets: designing for and designing with. These correspond, respectively, to the 'user as subject' and 'user as partner' perspectives that are shown in Figure 24. Here we can see that probes, emanating from an expert-driven mindset, exemplify a designing for approach and cover both pre-design and generative components.

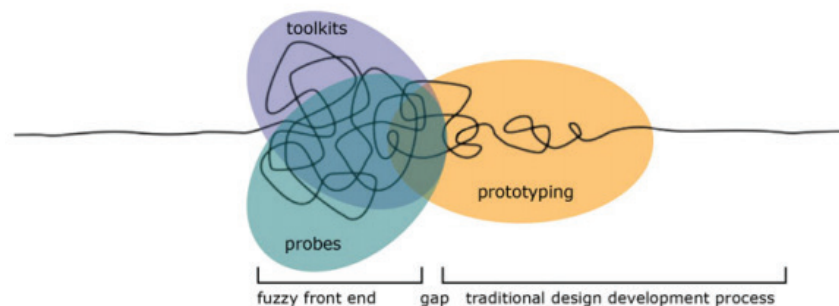


fig.24 Three approaches in a timeline  
Source: SANDERS, Elizabeth ; STAPPERS, Pieter Jan (2014). Probes, toolkits and prototypes: three approaches to making in codesigning, CoDesign [On line]. [Access. 17th October.2015].

Available in: <http://dx.doi.org/10.1080/15710882.2014.888183>.

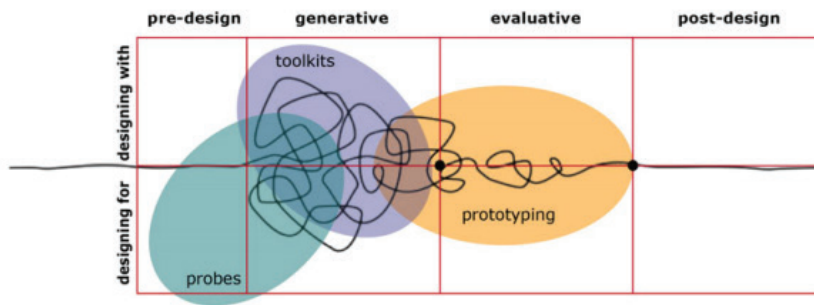


fig.25 Revision of figure 22

Source: SANDERS, Elizabeth ; STAPPERS, Pieter Jan (2014).

Probes, toolkits and prototypes: three approaches to making in codesigning, CoDesign [On line]. [Access. 17th October.2015].

Available in: <http://dx.doi.org/10.1080/15710882.2014.888183>.

Generative toolkits come from a participatory mindset and use the approach primarily in the generative phase. Prototyping, on the other hand,

can be conducted from either a designing for or a designing with mindset. The areas of overlap between probes, toolkits and prototypes have been carefully placed to reflect our perspective on the current state of the approaches to making. It is likely that the areas of overlap will become even bigger in the future as new methods and tools are continually being explored. The emerging landscape of design research and practice has also revealed that additional approaches to design and making are emerging depending on the time frame under consideration. Some approaches focus on the world as it is, others focus on the near future (e.g. the next generation) and still others are aiming at longer-term, speculative futures. Table 3 gives examples of the approaches to making from these three distinct time frames.

(Sanders & Stappers, 2014)

	Probes	Toolkits	Prototypes
The world as it is	Cultural probes (Gaver, Dunne, and Pacenti 1999)  Design probes (Mattelmäki 2005)	Toolkits for understanding experience: a day-in-the-life exercise	Usability testing of an incrementally improved redesign
The near future	Design Noir (Dunne and Raby 2001)	Toolkits for exploring future experience: my-ideal-future-product exercise	Usability/field testing of a radical new product
The speculative future	Diegetic prototypes (Kirby 2011)  Artefacts from the future (WIRED magazine)	Toolkits for experimenting with experience: make-believe role-playing with co-constructed artefacts	Research through Design prototypes (Keller et al. 2009)

tab.3 Examples of the approaches in three distinct time frames.

Source: SANDERS, Elizabeth ; STAPPERS, Pieter Jan (2014).

Probes, toolkits and prototypes: three approaches to making in codesigning, CoDesign [On line]. [Access. 17th October.2015].

Available in: <http://dx.doi.org/10.1080/15710882.2014.888183>.





*" When we invite everyday people into the design process, the tools, rules and methods for research and design blur. Research becomes more creative. Design becomes more relevant to the people we call users, adapters, participants and co-creators."*

*Sanders, 2006, p.5*

Sanders et al. (2010) reckons that a framework can help us decide which tools and techniques are most relevant for specific situations. It can also give us ideas for trying new things out. A framework points toward the future by revealing the gaps, holes and empty spaces that warrant further exploration.

Sanders et al. (2010) states that a method is a combination of tools and techniques that have been strategically put together to serve a specific purpose.

In designing the method, it is very important to think about the entire experience that the participants are going to go through. Each activity should prepare or prime them to successfully execute the next activity.



## Part III:

# Hypothesis

Based on the information gathered, processed and analysed that constitutes the theoretical framework we are able to formulate the following hypothesis:

A more durable product can be developed resulting in a more sustainable product directed at pre-adolescents, that can help younger generations connect to older generations through the exploration of basketry as a craftsmanship and an example of an Affective Design based product.



## Part IV:

# Active Research

Based upon the information collected from the theoretical framework, and with the intent to test the hypothesis rightness, a second methodological moment took place in which the principles of User-Centered Design and Affective Design were put in place in order to create a case study monitored by the researcher. The aforementioned moment, which culminated in the prototyping of a kit meant for kids to experience a new material through a do-it-yourself activity, passed through different stages of development that allowed the kit to come to fruition. This process began with a preliminary stage, followed by the development, evaluation and iteration stages leading into a reassessment of the results of the developing stage that subsequently allowed to validate the project and answer the research questions simultaneously.



# Part IV:

# Active Research

## **Preliminary Study**

### **Questionnaire**

- 1.1 Sample
- 1.2 Analysis
- 1.3 Discussion of results

### **The Experience**

- 2.1 Sensitizing kit
- 2.2 Generative Sessions
- 2.3 Pilot testing
  - 2.3.1 The Sample group
  - 2.3.2 Sensitizing Kit
  - 2.3.3 1st Session
  - 2.3.4 2nd Session
  - 2.3.5 Categories
- 2.4 Official sessions
  - 2.4.1 Sample group
  - 2.4.2 Analysis
  - 2.4.3 Discussion of results

## **Project**

- Project requirements
- Product Development
  - 2.1 The final set
  - 2.2 Booklet

## **Validation**

- The Usability Test
  - 1.1 Analysis
  - 1.2 Discussion of results

## **Iteration**

- Technical drawings
- Product's tree

## Preliminary study

To better understand the effects of the problem at hand and upon further research a strategy was designed meant to help the researcher in the specificity of the research. As such it became self-evident for the researcher that to truly understand the context of the problem, the preliminary study should help achieve two different goals:

Understand what are the targets' interests and habits.

Explore if the target subjects are able to identify a product resulting from craftsmanship as meaningful and if so if they are drawn to the idea of exploring its value and history.

These goals were met by wielding a questionnaire and planning a participatory experience in which the researcher was able to work closely with the target group. Because one preceded the other, the questionnaire became a valuable source of information that helped better formulate the exercises of the participatory experience. The need to gather specific information regarding the problem and the users dictated the choice to use these tools as to provide different insights that became complementary in the broader sense.

To achieve the first goal it was understood that a questionnaire was the best way to get a general idea of what are the target group's interests, habits and how they perceive craftsmanship and basketry. To put the strategy in place, a school willing to cooperate was found. Upon meeting with the school board it was established that the questionnaire was to be delivered to the 5th and 6th graders of the school since the students fall on the 10 - 12 year old margin that constitutes the targeted group. The questionnaire was therefore to be hand-delivered to all eight classes (four 5th grade classes + four 6th grade classes). A formal letter was written and forwarded to the parents of the students beforehand in order to inform that a questionnaire was to be delivered to their children, what the intent of the questionnaire was and ultimately to formally ask for permission to lead such a quantitative study. Upon given proper clearance the researcher successfully retrieved 181 fully answered questionnaires that were filled by students with ages between 9 and 15 years old.

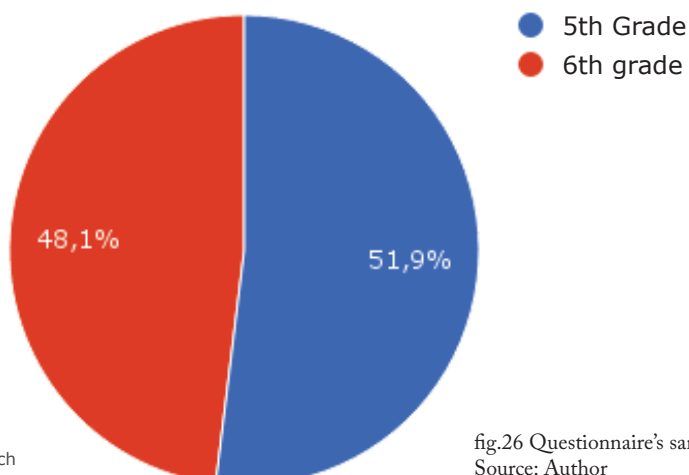


fig.26 Questionnaire's sample group  
Source: Author



To achieve the second goal it became clear that a more personal insight needed to be achieved. With that in mind a participatory experience was seen as the answer as it would provide the researcher with a more holistic insight. To start planning the experience it became instrumental to find a sample group to work with. Considering that participatory experiences should be held in a place where children feel at ease, that often means wielding such an experience in either a school setting or a home setting (Naranjobock, 2012) and as the experience is meant to be wielded with a group of children the idea of using a school setting was put forward as ideal as children there are already in a learning and experiencing new things mindset.

Considering that a school had already been contacted for the previous stage an extended request was made. The proposition was met by the school board with great enthusiasm and upon meeting with the head teacher of the Art's department the experience was found to be in line not only with the standards of the school but also the contents taught in E.T (F.T: Technological Education) lessons, as the contents of the experience aligned with the actual discipline program the partnering became obvious. Upon meeting with both teachers of the discipline a class was selected and the teacher of the selected class decided that the researcher could use the space of two 90 min lessons to wield the experience. Because the experience was set to take place during lessons a meeting with the school board was held to understand in what terms the experience would take place. As such, the board made clear that the experience had to be yielded with an entire class (approximately 30 students) and because the lesson was typically held with a divided class it meant that the experience was to be repeated with both groups of the same class<sup>1</sup>. It was also agreed that the researcher was to attend the next parents meeting of the selected class in order to explain to the parents the project and what would be asked of their children. The presence of the researcher would also allow the parents to meet the person who would be interacting with their children in class. A formal letter<sup>2</sup> was also drafted in order to provide the parents with a physical document that generally described the purpose of the experience and asked for the parents consent as a written permission is required before the students can participate, even if the experience takes place in a school setting (Sanders & Stappers, 2014). All parents consented and therefore allowed the researcher to define the sample group. As each half of the class was to integrate the experience two sample groups with 14 students were established:

<b>Sample group - Generative Sessions</b>		
Gender	A	B
Male	6	4
Female	8	10
Total	14	14

Tab.3 Generative sessions' sample group  
Source: Author

1 Unfortunately this meant that the researcher had no power in the choosing of the sample group or the amount of students it was to comprise. However the school demands were met because it provided the researcher with valuable support during the entire process, as the teacher of E.T was to assist in any way needed and the school board would provide the researcher with space, materials and staff.

2 See appendix 1

## Questionnaire

The planning of the questionnaire started by understanding that the questionnaire would be divided in three parts:

### > Introduction

Small text that introduces the purpose of the questionnaire and instructs the subject on how to properly fill in the questionnaire. In it the subjects are also asked to state their gender, age and grade level in order to help the researcher to properly understand the answer patterns according to age and gender.

### > Interests and free-time

Set of questions about what type of activities and toys they enjoy the most, what are their habits around old toys and how do they spend their family time.

### > Craftsmanship

Set of questions meant to understand how do they view craftsmanship and basketry and if they would be interested in exploring more.

Subsequently a few measures were adopted in order to build up a level of understanding of the questions and meet the needs of the subjects. The questionnaire was drafted and showed to the school board a few adjustments were suggested, such as adjusting the language in some questions and making the university logo stand out more the final version of the questionnaire<sup>3</sup> was made and tested before delivering it to the 5th and 6th grade classes.

## 1.1 Sample

Ultimately the sample group was comprised by 181 students in which 83 were boys and 98 were girls, which means that the girls represented the majority. From the 83 boys 47 were from the 5th grade and 36 from the 6th grade (represented in fig.27) and from the 98 girls 47 were from the 5th grade and 61 were from the 6th grade (represented in fig.28).

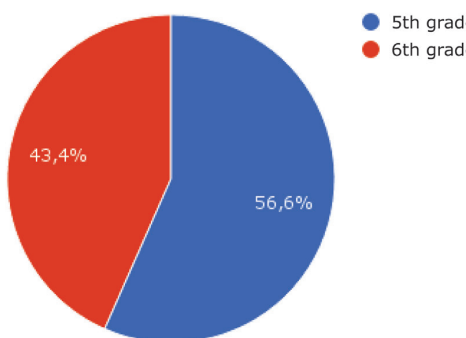


fig.27 Boy's sample group  
Source: Author

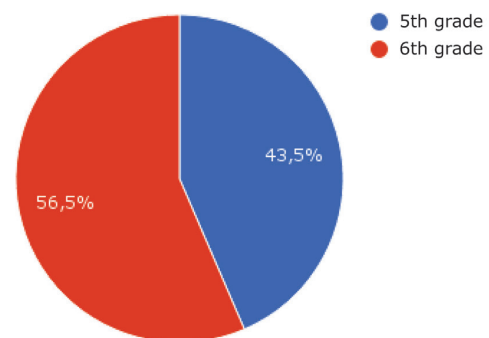


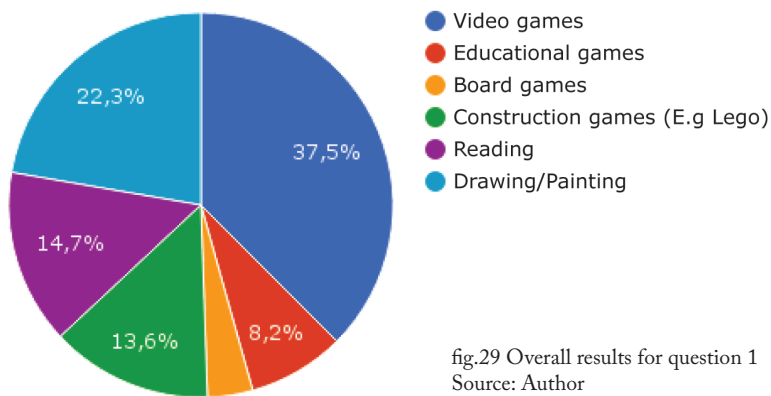
fig.28 Girls's sample group  
Source: Author

<sup>3</sup> See the full questionnaire in Appendix 2

## 1.2 Analysis

Through the questionnaire we were able to establish that a total of 37,5% students preferred to play videogames with a margin of 15.2% over Drawing /painting. However, when taking a closer look we can observe that,while the favorite remains videogames in 5th and 6th grade, in the girls' case we observe that if we consider the 5th grade alone the favorite is Drawing/Painting, and if we consider the 6th grade the favourite is Reading closely followed by Drawing/Painting.

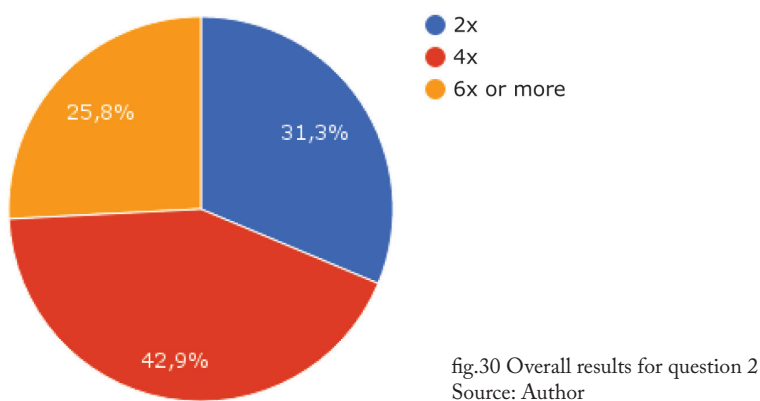
1.



In terms, of understanding how many times in the year they receive a toy 4x was put forward as the favored answer by a margin of 11.6 over the 2x choice. However a few discrepancies appear when analysing the answers of the boys and girls separately. By doing so we come to the conclusion that 5th grade boys favoured the 6x choice, 6th grade boys the 4x choice while 5th grade girls favoured the 4x times choice and 6th grade girls the 2x choice. Thus, concluding that boys admit to receive more toys in the year than girls in general.

When considering the choice of given toys the popular answer remained

2.



Draw in 3D with an average of 32.2% by a margin of a mere 0.5 % to Lego. When analysing the choice of boys and girls separately we understand that girls stuck with the choice of draw 3D however the boys seemed to agree upon the Lego choice. When asked about the choice made the most common answer was Because it allowed them to be creative. Be that as it may, upon further analysis we were able to understand that while the girls and 6th grade boys agreed on the Creative aspect, the 5th grade boys favored the Challenging aspect of the toy. We can further analyse the given answer by assessing the choice of Other where different answers were given, considering the answer we can say that the boys made their choice based on the toy's ability to be assembled, collectable, diferente, exciting and interesting. The girls consistently expressed their interest in trying new things.

### 3.

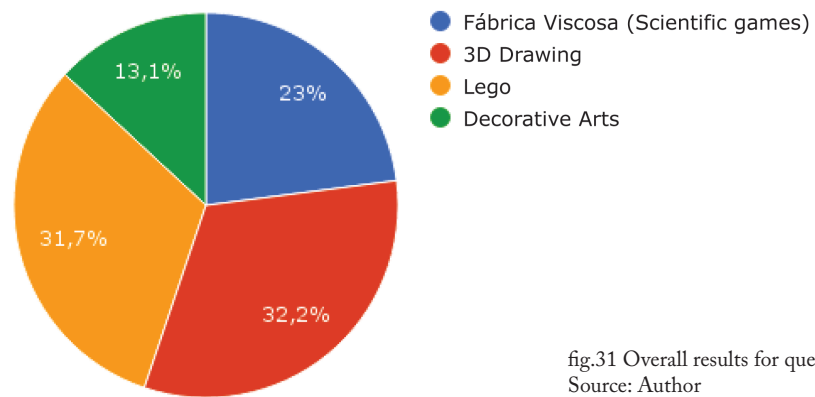


fig.31 Overall results for question 3  
Source: Author

### 3.1

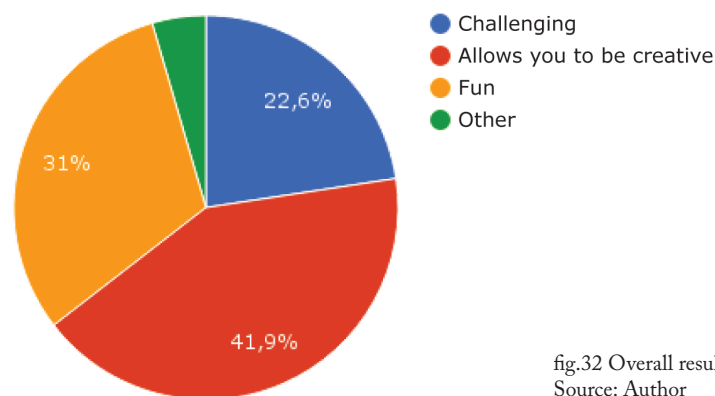


fig.32 Overall results for question 3.1  
Source: Author

When questioned over why do they stop caring about a toy the most popular answer was consistently stating that the toy had become unenthusiastic to them, the choice prevailed by a 45% majority and with a margin of 23.3 % over the choice Other, within this choice the most commonly given answer was that the toy was no longer age appropriate, followed by the toy becoming repetitive, they've become tired of it and forgetfulness.

4.

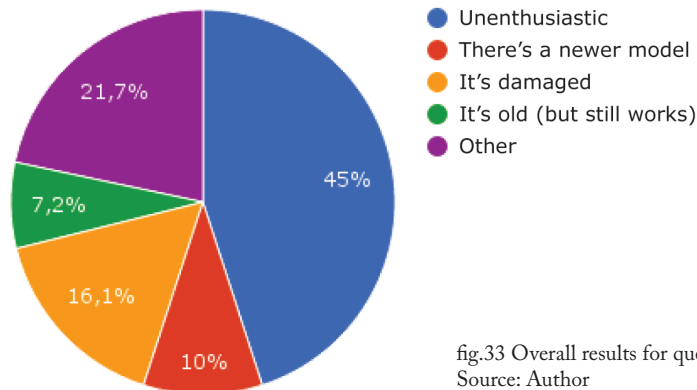


fig.33 Overall results for question 4  
Source: Author

After being questioned over what would happen to the toy the most popular answer remained, by all, given to other children/institutions with a 50.5% majority and with a 26.9% margin over it being given to a younger brother.

4.1

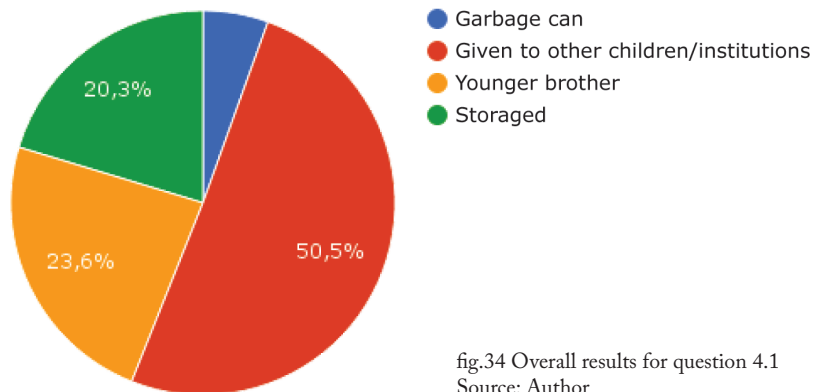


fig.34 Overall results for question 4.1  
Source: Author

5.

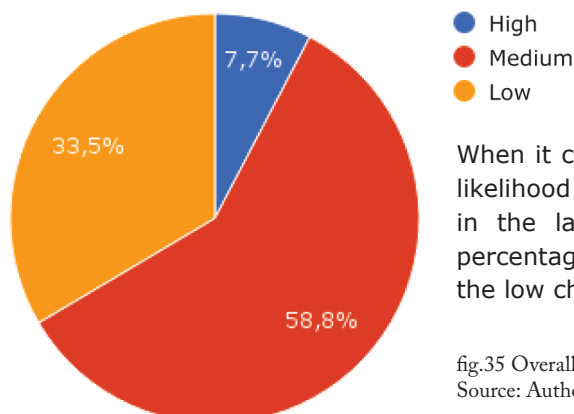


fig.35 Overall results for question 5  
Source: Author

When it came to putting forward a prediction of the likelihood of them losing interest in a toy acquired in the last year they answered medium with a percentage of 58.8 and with a margin of 25.3% over the low choice.

In terms of the amount of time they spend with their parents the most popular answer to the question – how often do you and your parents do family activities was unequivocally Some with a 51.1% average and with a margin of 16.5 to the answer A lot.

6.

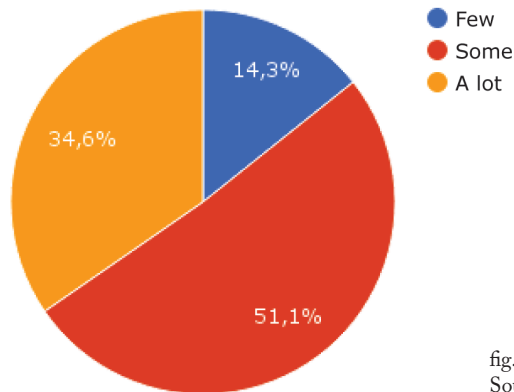


fig.36 Overall results for question 6  
Source: Author

When defining the type of activity they most commonly do with their parents the most common answer remained outdoor activities/physical activities with a total percentage of 56 and with a margin of 30.2 over the choice Other were many took the time to specify activities such as travelling, going to the movies, playing games watching games in the stadium and sharing a meal outsider the house.

7.

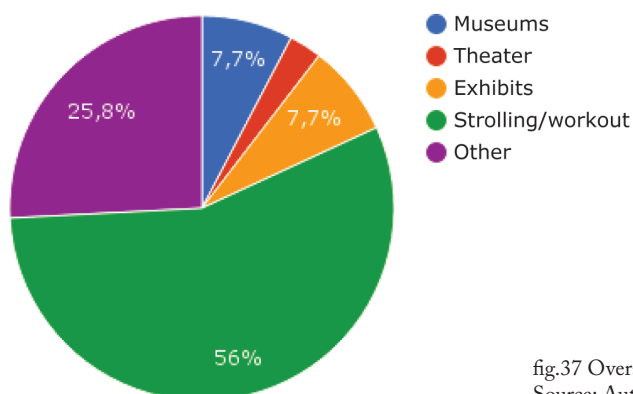


fig.37 Overall results for question 7  
Source: Author

After being questioned whether they found craftsmanship to be important in general the vast majority answered yes with a overall percentage of 87.9%. For the ones that answered with no the majority were boys and when asked to justify their answer 90.9% chose the option of it being Boring.

8.

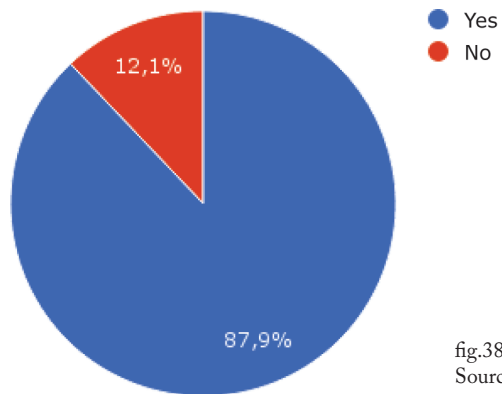


fig.38 Overall results for question 8  
Source: Author

8.1

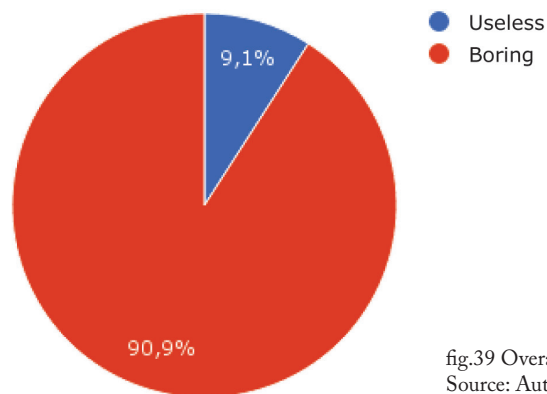


fig.39 Overall results for question 8.1  
Source: Author

When asked to define basketry by selecting three options the most chosen answers where Represents Portuguese Tradition with 26.8%, Useful with 24.3 % and lastly, Complicated with 21.3 %, the least chosen option was Useless with 3.87%.

9.

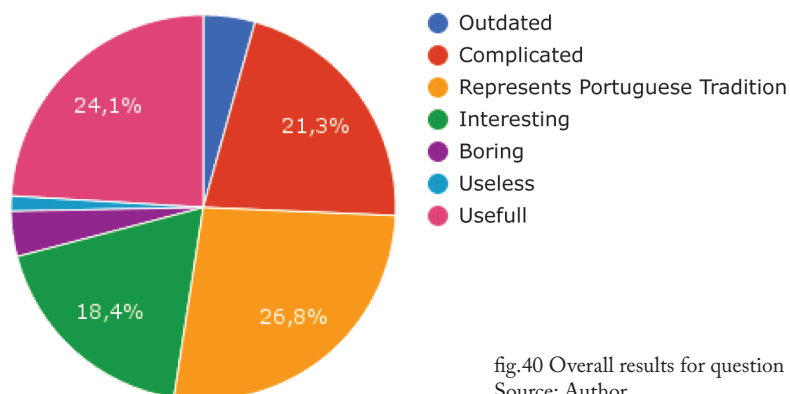


fig.40 Overall results for question 9  
Source: Author

When assessing if the material used in basketry, wicker, was recyclable the majority answered yes with a percentage of 70.3%.

### 9.1

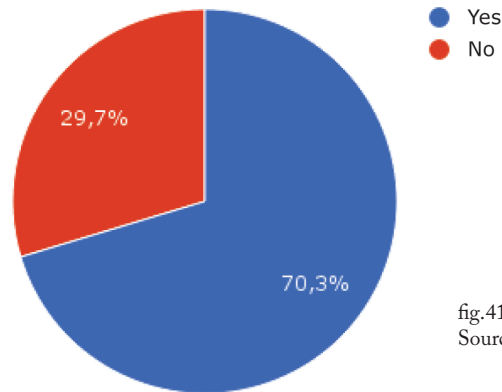


fig.41 Overall results for question 9.1  
Source: Author

When it came to assessing if they would want to learn how to work with wicker the majority (59.4% ) answered yes, upon looking at the data closely we were able to understand that the boys favoured the negative answer but were ultimately overwhelmed by the girls positive response. As for a reason the most used was because it was seen as Difficult with a majority of 62.9 per cent, a few answered Other and specified by stating that it was uninteresting, both boring and difficult, not good for it or didn't have who to teach them.

### 10.

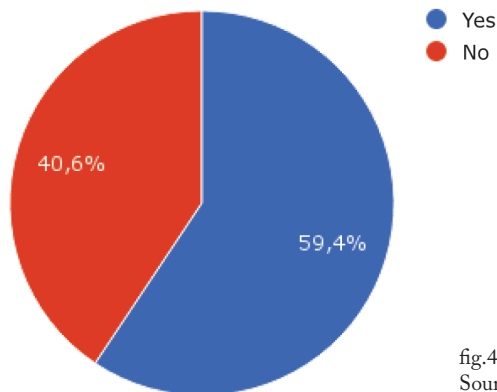


fig.42 Overall results for question 10  
Source: Author

### 10.1

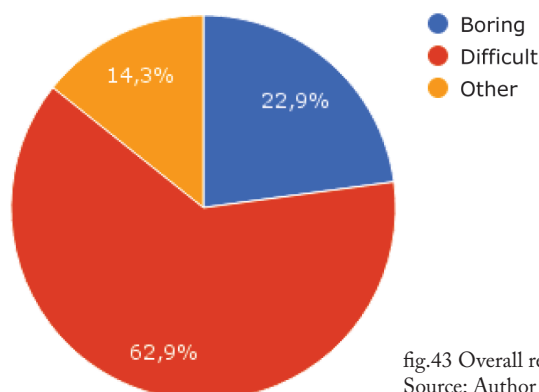


fig.43 Overall results for question 10.1  
Source: Author



### 1.3 Discussion of results

In conclusion, by leading this questionnaire we were able to assess that kids' opinions may differ according to gender in specific topics like interests but in more general topics their opinion align.

As such we were able to understand that for the boys the favoured way to spend their free time free is playing Videogames and for the girls is Drawing or Painting. This supports the idea that girls are more in touch in the exploration of their creativity. The girls admitted to receive toys at least twice a year and the boys admitted to receive toys at least four to six times in the year. As such, we can conclude that boys will more likely receive more toys in the year rather than the girls, this phenomenon might be linked to the boys favouring videogames which are consistently being launched through the year. Allowing creativity remained the prime criteria for girls which meant that given a choice over the toy selection Drawing 3D was put forward as the favourite. As for the boys the criteria changed to being challenging, which might be linked to their heightened sense of competitiveness, and simply being perceived as fun. Furthermore, a number of unforeseen reasons were also brought up such as being collectable, which may reflect a need for a sense of continuity or never ending challenge, and the mere idea of wanting to try new things as well as being exciting and interesting which are more subjective qualities. In regards to what makes a child lose interest in a toy, we were able to identify being damaged as an agreed main cause, however other valid ideas came up, these ideas revolved around the age appropriateness of the toy or growing tired of something that has been done several times before further implying the need of continued novelty.

As for habits regarding the disposal of toys, we were pleased to discover that the majority admits to give away their used toys to other children or institutions, even though this attitude is more likely parent driven it is commendable to observe the recycling of old toys in such a manner. However, when quizzed about the likelihood of the loss of interest of a recently received toy the answers supported the medium level of likelihood which suggests that they might be admitting their rapid loss of interest over a toy, which can mean two things, they aren't being stimulated properly or they are being over stimulated by the toy's market causing them to rapidly become interested in new more attractive and advanced toys.

In regards to family time spend, most the vast majority advocated that spends some family time, a close second was the spending of a lot of time with the family as such we are able to conclude that kids are spending a good amount of family time. When assessing the quality of this family time we were able to find that the results remained very positive as outdoors activities and physical activities were consistently put forward as a way to describe how the aforementioned family time was being spent. Nonetheless, some unforeseen answers were put forward suggesting that kids considered family time to be the sharing of a meal, travelling and watching Tv, going to the movies and playing games which further supports the findings.

In terms of understanding the kids perception of craftsmanship we were able to assess that an overwhelming majority finds craftsmanship to be important which comes through as promising to the success of this research. The minority that chose no revealed their answer to be linked to their perception of craftsmanship being boring which means that perhaps craftsmanship is not being properly communicated to kids with this age as they fail to see interest in it, therefore a design opportunity remains valid. When asked to focus on characterising Basketry as a craftsmanship form, the idea that the craftsmanship is representational of Portuguese tradition, which once more suggests that they understand it is importance and further elaborate on it by admitting that it represents part of the country's identity. However another favoured answer was that they saw basketry as being complicated which supports the theory that they think that such craftsmanships are out of their reach which might not be the cause. As it is our believe that in order to kids be interested in this sort of topics they must first understand them and connect with them which is easier to do if we have them experience it in their own way. We were also able to find that the majority of kids as no problem in recognising the level of recyclability of the materials used in basketry which supports the idea that they are able to discern what is more environmentally friendly from what isn't. When asked about their interest in trying basketry the majority of the answers remained positive however we were able to understand that the majority of the boys chose negatively but were overwhelmed by the girls choice, this situation comes as no surprise as we were already able to conclude that girls will more likely do something related to the arts rather than the boys, we add that the subjects that answered with no justified by agreeing that it was too difficult. This further suggests that the focus of this research should foresee that boys may be hard to please and therefore their opinion must be better understood also that the perception of it being difficult may overshadow their interest.

In conclusion and based solely on the results of this study we are not able to fully understand the kids perspective over basketry and what makes them gain interest in such topics as a more holistic approach is seen as beneficial to further comprehend the target group.

## The experience

The researcher found the questionnaire to be too constraining and that it failed to provide an in-depth understanding of the current context and mindset of children. As designers need information about the contexts in which the target interacts with products in order to design products that fit into the lives of the people who will use them (Visser et al., 2005) it became obvious that a more holistic approach needed to be employed. This holistic approach was achieved by planning a continued experience that served the purpose of meeting the goals set in the preliminary study stage. The following stage required a proper set of generative tools<sup>1</sup> in order to step by step plan the exercises of the experience for the researcher to collect the right type of information. Because there are a myriad of tools available, it was important to develop a plan for using them. To get the most out of tools it was required of us to outline what we wanted to learn, and begin developing a procedure that would build towards those goals

(Sanders, 2001).

As such the experience was intended to answer the following questions:

1. How are kids day-to-day lives, how do they spend their time?  
Do they have enough family quality time, are they active enough?
2. What do they think the world will be like?  
What do they expect the world to evolve into?
3. What do they understand about craftsmanship?  
Can they understand what meaning craftsmanship holds?
4. Are they able to connect to a form of craftsmanship?  
Is basketry a good form of craftsmanship for them to connect with?
5. How do they think that other kids will connect with craftsmanship

To achieve the set goals the experience was designed based on the idea that each stage will provide proper input to the following stage and would ultimately culminate in the project development.

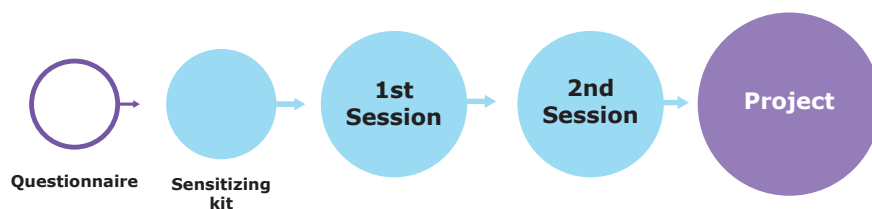


fig.44 The experience designed  
Source: Author

<sup>1</sup> According to Sanders (2000) generative tools give access and expression to the emotional side of the user's experience and acknowledges its subjective perspective. They are also able to reveal the unique personal histories people have that contribute to the content and quality of their experiences. These are qualities useful to those of us involved in making people-centered decisions.

## Sensitizing Kit

Included three exercises - Workbook, Diary and Postcards that helped the participants to:

- Get in touch to what their routines are
- Feel comfortable to express themselves through drawings or words
- Trigger their critical sense

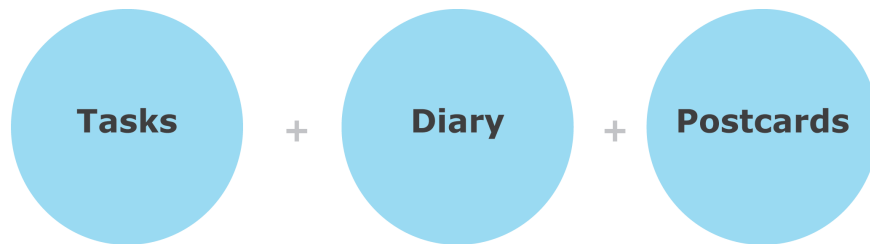


fig.45 The Sensitizing kit  
Source: Author

## 2 generative sessions<sup>2</sup>

(As two 90 min lessons were granted)

### 1st Session

The 1st session focused on craftsmanship and its meaning and if the kids were able to connect with it. The session started with a collage, followed by two debate moments in which selected pictures representing specific ideas such as old, machines and products to more abstract ideas such as identity, regionality and tradition were used to trigger conversation<sup>3</sup>.



fig.46 The 1st Session  
Source: Author

<sup>2</sup> A generative session is a meeting in which participants do generative exercises. Participants receive instructions and sets of expressive components and create artefacts that express their thoughts, feelings, and ideas. Their experiences are revealed when they are asked to present and to explain these artefacts to the other participants in the group. Considering that the sensitizing kit preceded the sessions as a form of preparation the researcher found that it was legitimate not to refer to the sensitizing packages at all during a session. (Visser et al., 2005)

<sup>3</sup> Images were identified, by the researcher, as powerful triggers and therefore seen as an useful tool. It was acknowledged that through using visualization exercises to explain abstract topics can help designers understand how people are making sense of the world, helping uncover a range of design factors from physical to social and emotional factors helps grasp the understanding of the design topic or design problem at hand (Jonsdatter & Gregory, 2006).

## 2nd Session

The 2nd session focused on having kids experience basketry through the exploring of its material by doing a simple exercise with the actual material. This experiment was followed by a brainstorm session in order to establish what would kids want to do and what would help them connect to craftsmanship.



fig.47 The 2nd Session  
Source: Author

Overall this plan helped establish a clear line of communication where they were first asked to gain conscious about themselves and their surroundings to slowly have them focus about what is around them, what objects may hold a deeper meaning and why, how do they feel about this meaning and if they are open to explore more.

### 2.1 Sensitizing Kit

It was understood that often the results of a tool can be incomplete unless participants have thought about the experience being investigated in advance. It was found that this situation could be handled by sending a workbook to each participant before the experience (Sanders, 2001).

It was later established that a workbook can contain different types of questions, such as demographic information, opinions and general information about the subject. This would allow us to learn details about the sample group without using up meeting time, and because of it it was suited to less discussion-based issues such as their routines and interests (Sanders & Williams, 2001). Thus it was decided that a workbook should be delivered to the participants and that it was to be more focused on them and their habits, it could also contain some hints of the topics to be discussed in order to prepare them for the sessions. Upon further research we came across the term sensitizing kit<sup>4</sup> that best fits what the researcher found the workbook did for the experience. Sensitize means to make sensitive for (Visser, 2009) which falls in line with what the workbook was meant to do. Upon further research it was found that this sensitizing packages are meant to stimulate reflection on the participant's' daily experiences. They could also be sources of information for the researchers, but were usually not designed for structured analysis as is the case for questionnaires (Visser, 2005).

<sup>4</sup> Term associated with a generative design research methodology called context mapping which is a young and emerging field. Its framework is still underdeveloped however the researcher used it as a source of information to design the experience as it loosely provided guidance. A context mapping study typically involves a sequence of research steps including preparation, sensitizing participants, group sessions, analysis and communication (see Figure 48). This approach partially mimicked what the researcher intended to do.

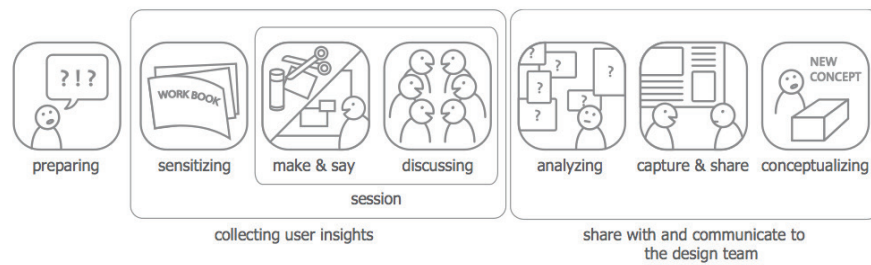


fig.48 Contextmapping

Source: SLEESWIJK, Froujke - Bringing the everyday life of people into design. Technische Universiteit Delft, 2009. Additional note (PHD Thesis).

It was ascertained that this packages often include tools such as the workbook that are described as being a small booklet with open-ended questions to answer and small drawing exercises (Visser, 2005). Due to the personal nature of this exercise the researcher found that it would be a good exercise for the participants as they are kids and are generally drawn to the idea of making something their own and expressing themselves. Because the workbook was more task oriented the researcher found that another useful exercise would be to have the kids keep a diary. A diary is much alike the workbook but it focuses on asking the participant to do, write or draw something each day in a more descriptonal way. This was found to support the participant to continually think about their routines and maximize the use of the experience timespan.

Because it was important to trigger their minds to the topics that would surface during the experience it was found that an exercise with Postcards could be useful as well as it would provide visual stimuli and trigger their critical sense. (Visser, 2005).

However on the back of the researcher mind there was a fear that the kids would find the exercises childish or irrelevant and would become uninterested in filling in the Sensitizing kit. Such fears were triggered by the notion that the target group is constituted by pre adolescents which means that they can be ruthless and quick to judge a task as uninteresting and fail to engage on the tasks (Gielen, 2008) as such the kit was to design to be as fun and as creative as possible filled with drawing or writing exercises and with a collage exercise.

The sensitizing kits<sup>1</sup> were delivered to each group approximately a week before the 1st session and every single kit was successfully retrieved in both groups. The kit was ultimately divided in three separate exercises and all had associated tasks, the exercises are explained bellow.

## Tasks

The tasks booklet comprised drawing exercises that required kids to express themselves and reflect upon their world by singling out their

<sup>1</sup> To see full kit see appendix 3

likes and dislikes, who or what matters to them, how do they prioritize their family, friends and possessions, how do they view their country and how do they see the future.

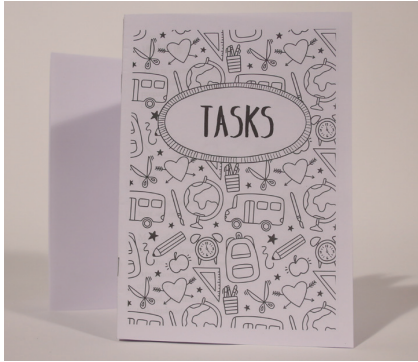


fig.49 Tasks booklet  
Source: Author

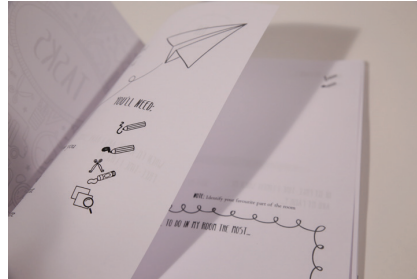


fig.50 Tasks booklet's detail  
Source: Author

## Diary

The diary asked them to describe certain aspects of their day everyday life by means of self-documentation such as writing or drawings which allowed them to be more self aware of how they spend their time, this became very helpful during sessions because it allowed them to give more realistic answers about how they would do certain things at home.

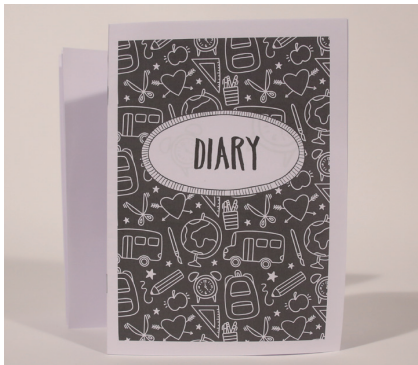


fig.51 Diary booklet  
Source: Author

## Postcards

The postcards made them look at certain situations and comment on them (without any other instruction).



fig.52 Postcards exercise  
Source: Author

## 2.2 Generative Sessions

Because different tools yield different results, some are inherently more useful than others for the discussion they generate (Sanders,2001). Ultimately the experience wanted to provoke discussion causing different points of view to surface, collages were seen instantly as a useful starting exercise because of their power to enable storytelling through the exploring of images and words, followed by the participants presentation as they are required to talk about their collages. Because children tend to be more exploratory than task directed (Druins,1999) and because this exercise has an exploratory basis it became a stimuli seen as beneficial as it would help them explore and better articulate their thoughts through pictures and words (Sanders & Williams). The researcher decided that one of the exercises of the experience would be a collage that small groups of students (2 to 3) would do with the premise - What is Craftsmanship? - this would allow us to better understand their thought process and what images and words they associate with craftsmanship as a whole and then further explore their point of view through a more debate based exercise.

However the decision to have one of the exercises be a collage prompted the question of in what order should the tools be presented and what tools should be used. This issue became very important as it would dictate the results that we would get (Sanders, 2001).

Ultimately, it was decided that the sessions should follow a clear line of thought in order to take the participants in a journey-like experience. So it was established that the **first session** would be divided in 3 moments:



fig.53 First session organization  
Source: Author

### **1st moment - Make & Say**

Collage made by groups of 2 to 3 using a set of 48 images (selected by us) and a set of 50 words to describe Craftsmanship.

### **2nd moment - Discuss**

This moment is divided into two separate discussions:

> Craftsmanship vs Industrial production (general) accompanied by a set of 4 images<sup>1</sup>

<sup>1</sup> See full set in appendix 4



> Abandonment of basketry (specific) - accompanied by a set of 6 images<sup>2</sup>

This order would allow the conversation to start from craftsmanship as a whole, progress to a conversation about how products are made and what their value is in order to have them understand the value of craftsmanship and based upon a form of craftsmanship have them discuss how the decay of basketry came to be, what are their thoughts about it and what do they feel can be done.

**3rd moment - Explore**

Comprised a quick exercise where kids were allowed to hold a piece of dry and wet wicker and understand the differences and qualities of each. This would serve as a trigger for the next session.

Below the first planning and duration of the exercises, required material and a set of checklist points based on Sanders & Stappers, 2014.

Time	Action	Material	Checklist
5 min	Introduction		Lesson planning, goals and Explain that they are the experts
5 min	Warm-up		Presentation and answer the question
15 min	1st exercise Collage - make	Images and words	What is craftsmanship - Represent through images words and/or drawings
10 min	Collage - say		Present and discuss
15 min	Craftsmanship vs Industry - Discuss	Set of 2 pictures	What are the main differences, what is the importance of each
15 min	Wicker abandonment - discuss	Set of 4 pictures	Persona - Storytelling - Empathy What causes the situation?How can it be solved?
10 min	First contact with wicker	Wet and dry wicker	How does the material behave and what is its potential
10 min	Evaluation		Have they learned something new? What do they think about basketry? Are they interesting in trying?

Total: 90 min

tab. 4 Planning of the 1st session  
Source: Author

The **second session** was divided into three moments:



fig.54 Second session organization  
Source: Author

<sup>2</sup> See full set in appendix 5

### **1st moment - Try**

The students will make a quick and simple exercise with wicker that will allow them to get a sense of the material.

### **2nd moment - Q&A**

In which they reflected about the positives and negative aspects of the experiment considering what they found most difficult to deal with and why

### **3rd moment - Brainstorming**

They will reflect upon their experience and engage on a brainstorming session for ideas of how other kids could engage in talking and learning about these topics and what they would want to do for this exercise a set of images will be used to provide a stimulus.

Below the first planning and duration of the exercises, required material and a set of checklist points based on Sanders & Stappers, 2014

Time	Action	Material	Checklist
5 min	Introduction		Explain the lesson planning
5 min	Warm-up		Presentation and answer the questions
20 min	Wicker	Wet wicker	Understand the potential of the material
15 min	Q&A		What were the main difficulties? What can I develop
30 min	Brainstorming		Individual exercise with a formal presentation
10 min	Conclusion		What do they think about wicker? Would they like to explore more on their own?
10 min	Evaluation		

Total: 90 min

tab. 5 Planning of the 2nd session  
Source: Author

## **2.3 Pilot testing**

After defining the experience it was imperative to try out the set of instructions and picture/word sets on a few pilot subjects to get their feedback. Considering that as obvious as the instructions may seem on paper, they may be perceived as vague or unclear when spoken aloud to a person unfamiliar with the task. We recognised that kids aren't asked to be apart of this type of experience everyday, so it was important to make sure in advance that they would understand it (Sanders & Williams, 2001).

Therefore a pilot test was planned where a complete run through of the entire planned experience was held and helped test all contents and necessary materials in a "as close to reality as it can be" environment.

Having a pilot test as a beginner in the generative design research process became essential as it provided the researcher with real concrete feedback of every aspect of the experience. It also helped test:

- .The timings of the session
- .The order of the activities within the session
- .The wording of the instructions
- .The appropriateness and clearness of the adopted language
- .The adequacy and efficiency of the recording equipments

Ultimately the pilot test was critical to help level out the appropriateness of the design elements, vital to determine timing, the flow of the session and more importantly to help bring the researcher into a place where it was comfortable to speak with the participants.

Before putting the pilot test in place the experience was showed and explained to people found of interest such as the Tech. Ed. Teacher<sup>1</sup> and the school's Psychologist<sup>2</sup> since they are the ones that spend more time with the subjects and are more in touch with their abilities and difficulties. To further evaluate the sought effectiveness of the experience the field of psychology was seen as an asset, as such and after careful research, contact was made with a field teacher specialised in development of cognitive behaviour in the creativity and inclusivity areas<sup>3</sup>.

After analysing the information retrieved from the interviews the experience suffered some small adjustments.

### **2.3.1 The sample group**

The pilot testing phase was held with a group of three students from one of the Tech. Ed. Teacher's classes, the students were chosen by the teacher and allowed to skip two 90 min. lessons to be part of the pilot test a full week earlier than the official testing phase. The final group was composed by two girls ("Rita" and "Maria") and a boy ("João") chosen according to their abilities, the teacher intended to provide the researcher with a heterogeneous group, as such the teacher explained that the boy ("João") and one of the girls ("Rita") were considered to be (by him) good students, the second girl ("Maria") was chosen because (according to him) she struggled with her fine motor skills.

#### ***First Impression***

First contact with the group was made when delivering the sensitizing kits. At that time the researcher was able to quickly draft up a general profile of each subject.

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1 See appendix 6

2 See appendix 7

3 See appendix 8

As such:

“Rita” appeared to be a confident and extroverted person, a clear leader.

“João” appeared to be an easy-going and hard-working boy.

“Maria” appeared to be a bit clumsy, introverted but committed

After the experience they were reprofiled as:



“Rita”	“João”	“Maria”
Organized and opinative Detail oriented Self imposing	Extroverted and communicative Curious Easy to talk to	Committed, Difficulty in expressing and imposing herself Clumsy

tab. 6 First impression on subjects of the pilot test  
Source: Author, icons adapted from the free graphic resources bank [www.freepik.com](http://www.freepik.com)

### 2.3.2 Sensitizing kit

The pilot test phase of the sensitizing kit allowed the researcher to understand beforehand the personalities of each kid which helped prepare how the exercises of the sessions should be delivered and how communication should be established. As such, the sensitizing kit was regarded as very helpful and useful as it provided a sense of who the subjects were as intended. Because of it the researcher was able to understand before interacting with them that:

“Rita” - Organized, methodical, studious, extroverted and social

“João” - Creative, expressive, extroverted, active and social

“Maria” - Introverted, studious and social

Because the pilot test was held with only three students it was later understood that this provided the researcher with an almost unrealistic idea of the effects of the kit, as because of them we were able to understand their personalities and foresee how they would probably react to the exercises because they were few. In contrast, the official testing was held with a full 14 students group and this meant that the group dynamics would be more complex and different. Nonetheless, the pilot test more than anything else helped understand if the language and chosen exercises were appropriate and well received, which they were, however the need for a few adjustments to be made became apparent.

To better analyse the gathered data a table<sup>1</sup> was made in order to provide a clear and transversal notion of what was discussed, in what time, caused by what and what problems emerged. Consequently the researcher was able to easily identify a few exercises that were lacking in specificity and therefore seen as too ambiguous to achieve valuable information. Based on the output of the aforementioned table changes to the kit were made and a better notion of how their personalities and habits were was provided which helped bestowed the researcher with a better notion of how to interact with them and what type of personalities would we be interacting with, further allowing adjustments to be made in terms of how to approach them and ask them to participate and how to assert ourselves in their presence.

### **2.3.3 1st Session**

The pilot test of the 1st session allowed the researcher to understand a few key aspects. Firstly, a revision of the materials of the first exercise needed to be made as they became problematic due to the fact that they were later understood as being too directional which resulted in unwillingly not allowing the kids to actually think about Craftsmanship. Such findings resulted on the decision to eliminate the word selection and have kids find their own words instead. Secondly, there was a need to refine the image selection as a lot of the pictures were selected by being perceived as safe bets. Meaning that they once again weren't being stimulated to think beyond the obvious, as such the number of pictures representing products and people working with their hands were seen as being part of the problem and therefore were significantly reduced to a mere two or three out of a total of 50 images. Thirdly, by testing the first session we were also able to single out some problems in the way the exercises and questions were being delivered. As such a need to adjust the level of language was needed as the kids at times struggled to understand what was being asked, therefore feeling the need to recurrently ask for a more suitable explanation.

By testing the first session we were able to establish that some adjustments to the materials and language needed to take place, we also found that some personalities may overpower others as "Rita" was perceived as very imposing, which appear to damage the dynamic of the group as the other two kids almost weren't allowed to intervene as much. As a result the interaction was mostly led by "Rita". Because they didn't interact well with each other and their ideas didn't flow as one, the position of the researcher as a moderator was seen as instrumental to avoid the situation however it was understood to be lacking and a need to change was recognised.

The entirety of the gathered information and stated conclusions are presented in a single table that relates the exercise with the results and underlying conclusions which can be further analysed in appendix 11.

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<sup>1</sup> See appendix 10

### 2.3.4 2nd Session

By carrying out a pilot test of the complete 2nd session we were able to understand the appropriateness of the selected exercise and what difficulties might occur. The exercise was met with great enthusiasm and because of it they became very focused on the task and very excited at the same time, it was a new experience for them. They were able to follow the steps but were a bit fearful at first because they didn't know how the material was going to respond to them. "Maria" was on the whole a bit clumsy but managed to execute the shape properly. They were particularly excited by the decorating part and as they began to decorate they remained very focused and concerned with the overall appearance. Overall they didn't find it extremely difficult but there were some difficulties (splinters and pokes). It was found as expected that they were extra motivated by the chance of making the product their own by decorating it, and were extremely concerned with how it would look. By holding this test we were able to understand that the researcher needed be more attentive of their needs, explain things slower and show them clearly and up close what they are supposed to do. We also concluded that the traws needed to be tailor cut as a few accidents with the pokes happened. When it came to the brainstorming session it was found that unexpectedly the pictures were proven to be limitative and unhelpful as a stimulus and were therefore discarded. We also found the need to develop a table (see appendix 12) to display the gathered information in this second session.

### 2.3.5 Categories

To analyse the effectiveness of the experience key categories were found and later attributed to the data to verify that all key topics were being talked about.

As such the selected categories were:

**Identity** - Evaluate how much of their personal input is brought out, understand their regional and national identity knowledge and if they are being properly triggered.

**Availability/Drive** - Evaluate their availability, motivation and willingness to learn about the meaning of craftsmanship.

**Knowledge** - Analyse the level of understanding and what gaps may occur that can be attended to in the product.

**Empathy / Appetence** - Evaluate the level of their ability to connect to the topic on an affective and emotional level.

**Technique** - Evaluate their knowledge of production process, market development and understand their technical difficulties, etc

The result of this analysis resulted in a preview of what the final analysis of the official sessions will be like and therefore helped established the efficiency of the tools.

## **2.4 Official Sessions**

After the pilot testing a few modifications to the original plan were made culminating in the final set of materials available in appendices 13, 14 and 15

### **2.4.1 Sample group**

The selection of the official sample group was determined by the board of the school which decided that the experience could take place in their perimeter under the condition of it being held with an entire class which meant that the sample group consisted of a 6th grade class (average 30 students) as such, the class was selected by the Art's department teachers and was described as a well behaved and curious class, the class's head teacher<sup>1</sup> referred to it as a collaborative and open-minded dynamic group in which all elements work well together. The entire class had 28 students and because the sessions were to be integrated within the subject of Technical Education (Educação Tecnológica) it meant that it had to respect the schedule which divided the class into two groups in the Tech.Ed. lessons which meant that the sessions needed to take place with two separate groups in two separated schedules and two different rooms which required that group B did the sessions after group A. As such, all the materials were first experienced by group A who was advised to not say anything about the sessions to their peers. However this meant that we virtually had no control over exchanges of information that may have taken place between the two groups between sessions.

#### **Group A**

Was perceived as a very committed and curious group as a whole and asked a lot of questions which was very helpful during the debates as they remained cordial opinionative

Group A had 8 girls and 6 boys and the girls were more talkative, some of the boys and few girls were more introverted and shy and attempts to help them communicate more were held some unsuccessfully

As a whole, it became obvious that certain individuals were clear conversation starters which helped the sessions flow. Others found it difficult to express themselves even when being directly asked to voice their opinions, but as they became more comfortable with the format of the sessions they grew more confident and opinionated. As a result the group was generally easy to control and very opinionated which helped the flow of the sessions.

#### **Group B**

Was an excited and very enthusiastic group, as a result they were generally more disorganized but very expressive and extroverted. Because of this group's dynamic at times it became difficult to understand everyone as they would constantly speak over each other and as a result the debates progressed quickly as ideas were quickly conveyed. Group B had 10 girls and 4 boys and the girls lead the conversation most of the time as they were more extroverted, social and talkative. The boys were

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<sup>1</sup> See full statement in appendix 9 in min. 1.16 to 1.25 and min.2.04 to 3.19

generally more introverted but were still able to voice their opinions but often only upon request. As a group they were very expressive and very vocal which proved difficult to follow at times but above all they were a very cohesive and well-balanced group that worked well together. They worked particularly well in the practical exercise as they were patient and dextrous when handling the material.

## 2.4.2 Analysis

Alike the pilot testing phase tables of the gathered information<sup>2</sup> were constructed and the found categories were attributed to simplify the analysis process. After the attribution of categories to the gathered data an in-depth analysis of the information found in each was subjected to a closer look from it the results of each session emerged which we proceed to analyse below:

### First Session - 14 students - | 10/05/16 - A| 11/05/16 - B - 90min total

Identity Personal - personal input , regional and national		
Output A	Output B	Overall conclusions
<p><u>They appeared to be able to understand the link between craftsmanship, symbolism and tradition.</u> This notion was held by a few in the first exercise, but upon the following discussion (D1) they <u>all seemed to generally understand that craftsmanship is a way of perpetuating a form of tradition that ultimately represents a piece of a country's culture and therefore it is part of its identity.</u> This notion is consolidated by the answers provided in the evaluation exercise in which the vast majority was able to on their own successfully link craftsmanship to our country's tradition.</p>	<p>Despite being able to identify the presence of craftsmanship as ubiquitous, <u>they didn't seem to understand its value as a representation of a cultural identity,</u> which may be because perhaps they don't understand the idea of and identity other than their own. As the session progressed they <u>began to hint that craftsmanship is connected to concepts like storytelling and representation of a culture</u> which suggested that after giving it a second thought they <u>can understand that craftsmanship is related to our country's individuality and helps create our image.</u> In the second part of the session, were we discussed the history and current situation of basketry, they <u>seemed to forget what the concept of national identity was which resulted in them going back and forth with their ideas surrounding craftsmanship,</u> stating that basketry has as a sole purpose selling products, which opposes to the previously established idea that craftsmanship intents to be more than a mere business. In the evaluation process they went back to the idea that craftsmanship represents our tradition.</p>	<p>Group A was consistently able to identify craftsmanship as a tradition that has come to represent a country and therefore part of a country's identity. Group B seemed to generally understand the same idea but were inconsistent in identifying it during the entirety of the session, proving that despite being able to understand the concept some may struggle to fully interiorize the same idea and because of it they may require extra help.</p>

tab. 7 Identity analysis Session 1  
Source: Author

<sup>2</sup> See appendices 16 to 21, to see the full sessions report see appendices 22 and 23 and to see an analysis of the groups reaction to each exercise see appendix 24



**Second Session | 14 students | 17/05/16 - A | 19/05/16 - B  
90min total**

Identity Personal - personal input , regional and national		
Output A	Output B	Overall conclusions
<p>Because this session was focused on practical aspects of kids appreciation and interest in basketry specifically it is understandable that the subject of identity didn't come up.</p>	<p>Because this session was focused on practical aspects of kids appreciation and interest in basketry specifically it is understandable that the subject of identity didn't expressively come up. However <u>because the exercise was focused on their creativity and self expression, their individual identity was brought up through their designs this secured an exceptional response on their part</u>, which supports the theory that if they are personally invested in a project they will care and want to know more.</p>	<p>Because this session was focused on practical aspects of kids appreciation and interest in basketry specifically it is understandable that the subject of identity didn't come up in either of the groups however it must be noted that the decorating part of the exercise helped them make the fish their own, and reflective of each individual identity which helped them engage and be extra motivated as the personal factor is very valuable for them.</p>

tab. 8 Identity analysis Session 2  
Source: Author

**First Session - 14 students - | 10/05/16 - A | 11/05/16 - B  
- 90min total**

Availability/Drive - Time available, motivation, willingness		
Output A	Output B	Overall conclusions
<p>Quickly understood that craftsmanship is something that <u>should be preserved and passed on through the generations</u>. After being enlightened about the current situation of basketry and craftsmanship in general, they began to analyze the daily lives of people nowadays and acknowledge that people have <u>grown uninterested and isolated due to the rapid advances of technology</u>. And because they felt that people didn't care and the values of craftsmanship aren't being passed through the generations as they <u>feel that they aren't being properly informed about this sort of topics, despite strongly feeling that they should and that they would be interested in learning more about them</u>.</p>	<p>They seem to agree that craftsmanship is <u>not bound to be made by a specific age group and added that it must pass through the generations</u>. Suggested that <u>kids would be more interested in learning about basketry if they knew more about it, they felt that they didn't know as much as they would like about this sort of topics and this may be part of the problem</u>. As a whole they seemed very fascinated and eager to learn more about basketry as it <u>was something new to them</u>, and they felt it was important for them to know about craftsmanship and even confessed that they usually don't think about this because either they aren't aware or aren't told about it.</p>	<p>Both groups agreed that craftsmanship must pass through the generations and that they aren't as properly informed as they should. Group A added that this situation was perpetuated by how the rapid advances of technology caused people to become isolated and uninterested in these sort of topics. Group B added that craftsmanship can be done by anybody no matter the age which supports their interest in learning, despite the lack of such an affirmation by group a they too seemed keen on the idea of learning more as they find it important. In conclusion both groups want to learn more because they feel that it is important and because it is a new activity <u>that challenges them to explore their creativity</u>.</p>

tab. 9 Availability/drive analysis Session 1  
Source: Author

**Second Session | 14 students | 17/05/16 - A | 19/05/16 - B  
90min total**

Availability/Drive - Time available, motivation, willingness		
Output A	Output B	Overall conclusions
<p>They were very enthused by the experience, didn't feel put down by the experienced difficulties and felt that kids would like to try and would feel the same enthusiasm towards experiencing basketry given the chance, for that purpose they felt like <u>each kid should have its own experience and that that experience should be provided in some sort of center.</u> However in the previous session the <u>lack of time that kids have during the school period</u> was brought to the attention which may prove that the sole establishment of center could be fruitless because it would require kids to actually go to the center.</p>	<p>They were very eager to explore and know more about basketry but agreed that <u>other kids may feel differently as they feel that kids nowadays are more interested in technology rather than this sort of topics and the key could rely on showing them what they could do with wicker.</u></p>	<p>Both groups seemed to agree that it would be a challenge to get others kids to want to learn, however they both agreed that in order to do so other kids must be shown what they can do otherwise they won't understand and won't want to try. group A added that a sort of center could be created but added that during school period kids don't have that much time. Group B added that some kids are too caught up on technology that it could be challenging (but not impossible) to attract them to try.</p>

tab. 10 Availability/drive analysis Session 2  
Source: Author

**First Session - 14 students - | 10/05/16 - A | 11/05/16 - B  
- 90min total**

Knowledge - Level of understanding		
Output A	Output B	Overall conclusions
<p>At first they seemed to have a very narrow understanding of craftsmanship is simple <u>classifying it as a process in which the products are handcrafted</u>, disregarding its value and tradition. As the session progress they responded positively and quickly began to understand <u>the deeper meaning that it holds.</u> By the end of the lesson and after individually filling an evaluation sheet. It becomes clear that <u>they can understand its value but are unable to fully grasp its significance on their own proving that they may have a limited understanding.</u> This situation is brought to light by their <u>inconsistent speech, being able to through visual stimulus discuss the topic during the session but unable to do so on their own.</u></p>	<p>They appear to have a <u>general idea of what craftsmanship is but don't seem to explore their significance or understand its goal.</u> Identified it <u>as being more present in rural areas and attributed this fact to the limited existence of malls our big crowds.</u> Understood the evolution of basketry and that it isn't as present as it once were and that should be prevented, justified by saying that it is <u>less pollutant.</u> On the whole they seem to have a <u>superficial understanding of what craftsmanship is when it comes to its significance and importance.</u></p>	<p>Both groups generally understand what craftsmanship is but fail to attach a deeper meaning to it acknowledging it as a mere mean of production. Group B understood that it is more present in rural areas and thought the reasoning lied on how big malls aren't available in small towns hence the existence of small production that turns into craftsmanship, they also stated that craftsmanship was less pollutant. On the whole both groups, despite having different understandings of craftsmanship, to only have a superficial understanding of what craftsmanship truly means as they are able to understand it through stimulus but not able to do so on their own.</p>

tab. 11 Knowledge analysis Session 1  
Source: Author

**Second Session | 14 students | 17/05/16 - A| 19/05/16 - B  
90min total**

Knowledge - Level of understanding		
Output A	Output B	Overall conclusions
They seem to be aware that kids nowadays are detached from the real world as they are too stuck to electronic devices, they perceive this to be a problem that should be dealt with, and seemed to be keen on the idea that craftsmanship could be the answer as it is perceived by them as fun and a creative stimulus that kids nowadays don't seem to have.	Because it was a practical lesson it's natural that their personal knowledge didn't come through	The topic didn't surface in group B however in group A a discussion eroded and they suggested that they perceive kids nowadays as being too stuck on electronics and in need of real experiences adding that they felt that craftsmanship could be the answer.

tab. 12 Knowledge analysis Session 2  
Source: Author

**First Session - 14 students - | 10/05/16 - A| 11/05/16 - B  
- 90min total**

Empathy / Appetence - Level of ability to connect to the topic on an affective and emotional level		
Output A	Output B	Overall conclusions
They seemed to be able to <u>understand on their own that a craftsmanship product holds an intrinsic value due to the mean of production and what because of it it represents.</u> They suggested that <u>for kids to be interested in basketry they would have to actually try it and have their own experience.</u>	<u>They don't seem to be able to attach an affective value to craftsmanship pieces however they understand that it is something important and that it must be preserved and they seemed eager to explore this form of craftsmanship and are emotionally committed to find or at least help find a solution.</u> They implied that other kids are unaware of this sort of topics and in order for them to feel as interested and committed to know and experience as they do <u>they needed to be shown</u>	Group A seemed able to completely understand the value that this products hold. Whereas group B didn't seem to completely understand this value however that didn't seem to stop them from feeling strongly about wanting to learn about basketry. Both groups agreed that in order to get other kids to be interested they would have to be shown what they could do.

tab. 13 Empathy analysis Session 1  
Source: Author

**Second Session | 14 students | 17/05/16 - A | 19/05/16 - B  
90min total**

Empathy / Appetence - Level of ability to connect to the topic on an affective and emotional level		
Output A	Output B	Overall conclusions
<p>The opportunity to make them experience wicker on their own with little direction <u>proved to be challenging at times as they were very impatient</u>, however overall they were very excited and ended up loving the experience because they were <u>extra motivated by the do it yourself aspect of it and because it was an entirely new experience for them</u>, as such they came to the conclusion that for kids to be interested they would have to <u>definitely experience it on their own</u> for each to have their own experience and understand what they can do.</p>	<p>They were very committed to learn and do the exercise. They felt <u>extra motivated by the decorating process as it was their opportunity to make the fish their own and a chance to show other people what they did and learned</u>. As such, they felt that for other kids to have the same experience a sort of <u>Atelier or showcasing should be done, as they understood that only by allowing kids to experience and learn about basketry would their interest towards this sort of topics be triggered</u>.</p>	<p>Both groups were extremely excited and engaged however group A grew impatient which damaged their ability to complete the exercise on their own. Both groups were extra motivated by the decorating part as well which suggests that the make it their own approach could be a successful tactic to help kids engage in this activities. They also seemed to agree that kids had to be put in a position that would make them try and experience basketry on their own in order to help them fully engage and be interested.</p>

tab. 14 Empathy analysis Session 2  
Source: Author

**First Session - 14 students - | 10/05/16 - A | 11/05/16 - B  
- 90min total**

Technique - production process, market development , technical difficulties, etc		
Output A	Output B	Overall conclusions
<p><u>Were unclear to what separated craftsmanship from industrial production</u>. Which suggests that they are able to tell that it is a means of production but weren't quick to distinguish the goals of each mean. Upon discussing the topic through visual stimulus they were able to (on their own) define <u>craftsmanship as something that is made in small quantities as opposed to industrial production</u>. When it come to understanding craftsmanship they <u>found the material fascinating and cool</u>, were ultimately amazed by the amount of things that they <u>felt that they could do with it</u></p>	<p><u>Quickly identified craftsmanship as a mean of production and how a craftsmanship's piece is done</u>. Had <u>difficulty in understanding that craftsmanship means more than having a successful business but understood that it is a industry that is decline as it has become more rare to find</u>. When it came to experiencing wicker as a raw material and to then working with it they felt <u>fascinated by what could be achieved with this material, and felt that it was a very interesting and different material that they would like to try and explore more</u>.</p>	<p>Group A seemed to struggle with understanding the difference between industrially made products and craftsmanship ones, not immediately understanding why it is decline but quick to understand in what quantities it is produced. That wasn't the case with group B who quickly understood what craftsmanship is in what quantities is produced and that it is in decline. Both seemed to agree that they found wicker to be fascinated and were amazed by the amount of things that they could do.</p>

tab. 15 Technology analysis Session 1  
Source: Author

**Second Session | 14 students | 17/05/16 - A| 19/05/16 - B  
90min total**

Technique - production process, market development , technical difficulties, etc		
Output A	Output B	Overall conclusions
<p>Because it was a large group it was difficult to control everyone <u>which became a problem because they became impatient and began to stress out the material and not keep it wet as it was recurrently advised</u>. In the end they <u>didn't seem to be put down by the situation</u>, stating that they would like to try and do more with it and <u>blamed the situation on their inexperience</u> which could be achieved through time some <u>express concern to what would they do if it kept breaking</u>.</p>	<p>Had no major technical difficulties and as such found no downsides to working with the material and felt encouraged to explore the material on their own.</p>	<p>Group A struggled the most as they were very impatient and started to stress out the material by failing to follow instructions properly. Whereas group B found no difficulty in the exercise as they remained calmed and were more independent. Despite group A's experience both groups seemed to love the lesson and showed a lot of interest in doing more with it, group A merely expressed some concern to what would happen if they broke the branches straight away</p>

tab. 16 Technology analysis Session 2  
Source: Author

**2.4.3 Session's photos**

**1st Session**



fig.55 Collage  
Source: Author



fig.56 Debate 1  
Source: Author

**2nd Session**



fig.57 Result of the exercise  
Source: Author



fig.58 Brainstorming  
Source: Author

#### 2.4.4 Discussion of results

Overall the sessions were perceived as very successful and able to, like intended avail the research team with a realistic perception of how the target groups perceives the topics as such the session were able to assess a few conclusion. As such we were able to conclude that though some may be able to consistently identify craftsmanship as a tradition that has come to represent a country and therefore part of a country's identity. Others will feel difficult in doing the same however it was the general perception of the researcher that the group of those who can accurately do so outweighs those who can't.

It was also found of general agreement that craftsmanship must pass through the generations and that they didn't feel they were being as properly informed as they should which suggests that they are able to understand the importance and value of such objects but feel that some information is out of reach which ultimately represents an opportunity to design a solution able to do so and answer the research questions as well. We were able to consistently identify a wanting to learn more about the topics which is quite encouraging, as it advocates that kids are actually willing to learn and be interested in the matters, they just don't feel that the information is at their disposal. This interest maybe because the approach to the topics was more inclusive which prompted them to be more engaged.

We were able to further conclude that they recognise that leading kids their age to engage in something like basketry would represent a challenge. Nonetheless it was agreed that in order to do so other kids must absolutely be in a position where they'd try and see for themselves otherwise they won't understand or be interested in.

When it came to see if they were able to attach meaning to craftsmanship products some struggled to do so and had to be talked through it. This leads us to believe that they would need actual resources at their disposal in order to understand and properly assimilate the meaning of such craftsmanship products rather than naturally being able to do so.

As for fine motor skills, we found that the kids generally had the skills required to operate the wicker which leads us to believe that they would be able to interact with wicker on their own suggesting that the research questions could be answered by having them experiment with wicker on their own.

## Project

### Project Requirements

The first step in the project development phase was establishing the requirements of the product based on the gathered data and with the intent to achieve the best possible Product Design solution.

With that in mind the requirements were set after careful analysis and reflection of each and every step that was part and parcel of the preliminary study. Due to the nature of the gathered data special attention was given to what the participants stated. Crossing the statements of the participants with the objectives of this research it was determined that the product should contemplate each and every one of the pre-established categories from whom the product should emerge:

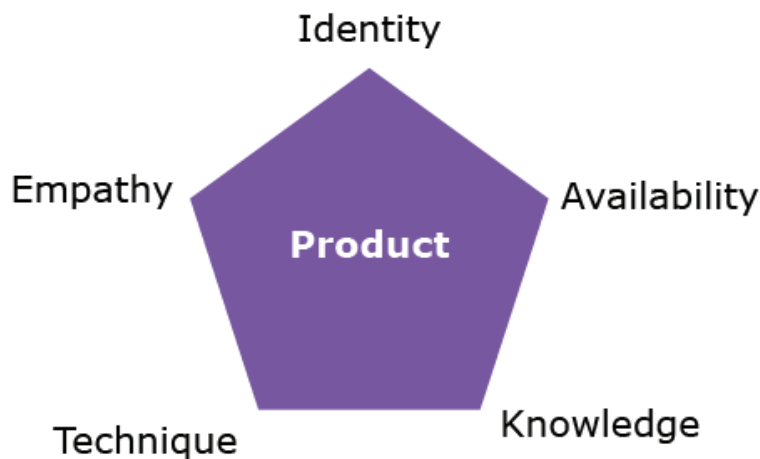


fig 59 Project Requirements  
Source: Author

With this in mind it was established that the product should be able to provide the user with a complete experience of what basketry is through experiencing it while instigating an exploratory moment that may bring the family closer by sharing the experience together.

As such the product should employ the concept of "learn and engage by doing". This concept would keep the experience personal and allow each user to experiment under their own terms. This provided the user with an unique opportunity to experience as much craftsmanship as they wanted to, while experience a material with history that could bring up a more personal approach as connections between material and memories of relatives and objects may be triggered.

With the requirements set and a concept found the conceptual phase began by analysing what the product could actually comprise. As such schematics were found to be helpful as they helped organise thoughts during the brainstorming phase.

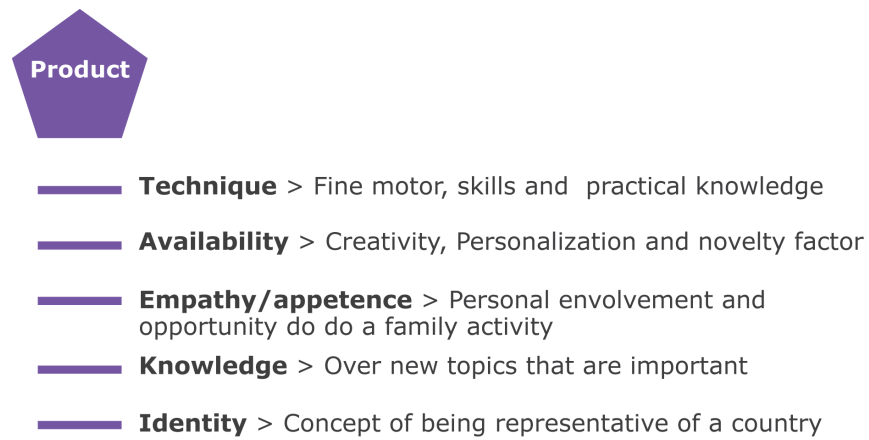


Fig 60 Goals scheme  
Source: Author

Upon satisfying conclusions sketching became a tool capable of conveying the formal appearance that the product could have and as such it was through drawings and schemes that ideas became one defined concept that would result in the product.

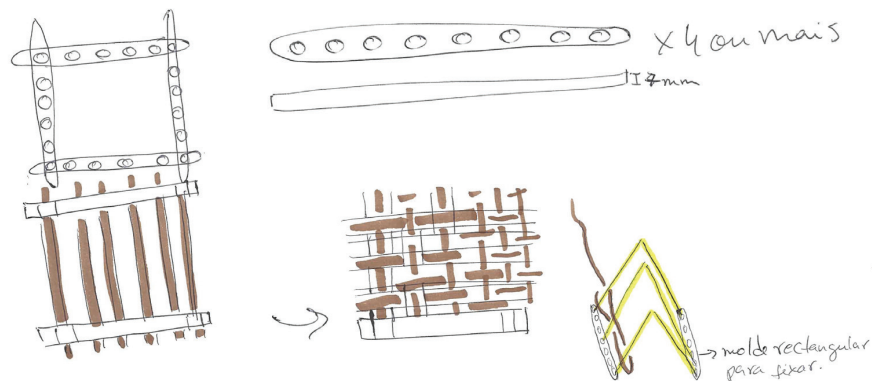


Fig 61 Sketches  
Source: Author

### Product development

As a result of the aforementioned phases it was established that the product would be a do-it-yourself product that would allow kids to experiment a material and with the help of a booklet get triggered to question the origin of the material. Thus it was defined that the product would comprise the following:

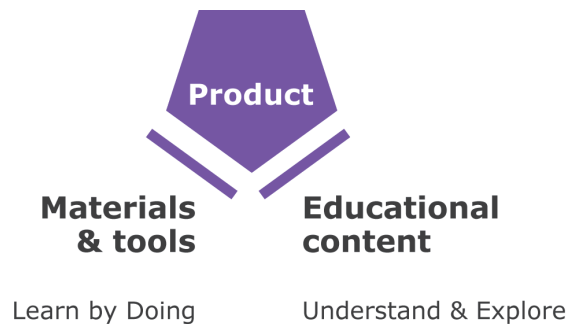


Fig 62 Concept  
Source: Author



## **2.1 The final set**

With the product completely outlined the conceptualization phase took place with the idea of by the end of it having several fully functioning prototypes to be utilised in the validation phase. Thus the process of prototyping every component became crucial as it would require effective means of production to be found by the researcher that would be capable of producing the components as many times as needed.

### ***Raw Materials***

Because wicker is a tough material questions regarding its safety were brought up and later disputed by the idea that despite wicker being a very tough material it can be managed by selecting different levels of thickness and appearances as such it was decided that "Liaça" (the shell of the wicker) would be a very easy-to-use and very flexible material and that wicker with levels of thickness below 5 mm would be ideal for kids to handle. Furthermore, to provide the kids with a wide range of possibilities it was decided that the kit would contain:

#### Raffia

Type of palm tree based thread very commonly used in basketry to sew or tie together pieces, this is also a material that kids are most likely familiar with due to its popularity.

#### Wicker

Full wicker in three levels of thickness ranging from 1-2 mm, 2-4 mm and 4-5 mm with a length of average 30 cm in order to fit the package and also allow kids to experiment within the medium scale object range. And three full wicker branches with approximately 60 cm length bended over a loop in order to fit and to help the handling of the material. The decision to have the kit contain full branches stems from the idea of having kids understand that wicker is a natural material that was cut and processed in order for them to experience it thus understanding where it comes from and hopefully feeling puzzled enough about its origin to seek information.

It was also understood that having the materials properly tagged with a set of instruction was of high importance, as we must assume that kids may or may not seek information before experimenting with the given material. Therefore this tag holds safety and formal information regarding the attached material in order to quickly inform the kids.

### ***Tools***

Considering that this product is a do-it-yourself product that uses multiple forms of wicker, the importance of designing the right tools to with the right materials was vital. After careful consideration and experimentation through working wicker in first hand a set of tools was designed meant to facilitate the usage of the wicker by the kids. At this point, we recognise the need to by the end of this phase we should have more than one fully functioning prototype to be utilised in the validation

phase. Thus the process of prototyping every component became crucial as it would require effective means of production to be found by the researcher that would be capable of producing the components as many times as needed.

Because this set was to be reproduced more than once a need to find appropriate means of production was found. Due to this fact a few production tests took place. This tests began by first choosing the right material.

The chosen material was ultimately the acrylic glass, because of the level of resistance that it can hold and because of how easy it is to contrive with proper machinery. Following this choice a question of thickness was put forward. As such a need for testing production processes was found. Consequently, a research of production methods involving acrylic glass was made and during this process the researcher came across Lisbon's Fablab where pieces of acrylic are often machined with two different techniques, Milling machine and Laser cutting. After, speaking directly with the technicians of the Fablab it was found that the laser cutting would be the best machine for the job as the milling machine was found to hold too many risks in comparison. As such, it was decided that the machining of the tools would be done by the laser cutter GCC Mercury III 60W<sup>1</sup> which uses a Co2 laser that allows it to machine a wide range of materials. After testing the machine by cutting through plaques of 0.5 and 0.2mm it was established that the 0.5mm thickness was more appropriate to the task and that the machine worked effectively as expected. This first test allowed the researcher to not only test the thickness of the plaques but the design of the tools as well as it made it possible for the researcher to test the tools with the wicker. And the final set was designed

The final set comprises a total of 46 pieces described in fig.63:

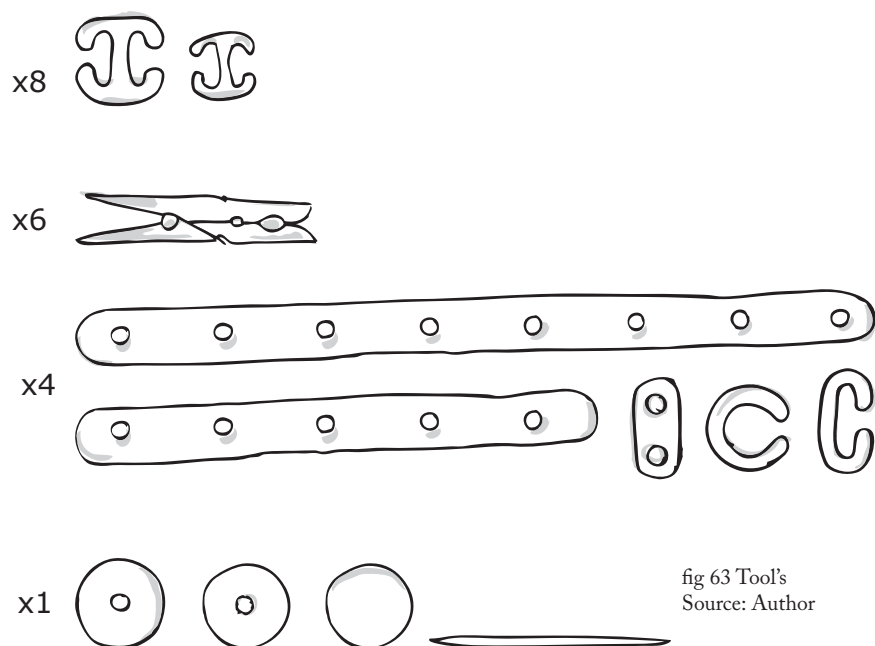


fig 63 Tool's  
Source: Author

<sup>1</sup> See annex 1 for machine's full description

## 2.2 Booklet

The booklet is a pivotal part of the product as it is through its content that kids are guided through the experiencing of a new material. Due to its importance carefully planning went into it causing it to reflect a journey where the kids are asked to first explore on their own the material, then question its background to lastly test their own abilities by experimenting to execute a few different ideas that hold different levels of difficulty. To guide the user through this full experience the booklet is sequentially divided into three chapters:

### Chapter I - Explore

Which presents itself as a starting point. Therefore in it a general explanation of what the materials is and a heed of how the user must act and prepare the material is made before making suggestions of how to approach the content of the package.



fig 64 Booklet : Chapter I  
Source: Author

### Chapter II - Discover

This chapter revolves around the idea of explaining what the material is, its history and its importance. Providing the user with a full idea of what he is working with and be triggered to start exploring why it is important to explore materials with such a rich and meaningful background.



fig 65 Booklet : Chapter II  
Source: Author

### Chapter III - Try

The research team at this point acknowledged that each kid would experience the kit in different ways and therefore understood that some kids may never even hold the booklet. Be that as it may, we couldn't help but to fall back into the findings of the experience held in the preliminary study which suggested that kids are drawn to the idea of trying something new and that ultimately they are interested in learning more about what is around them. Meaning that even if at the first they wouldn't care about the booklet, after experimenting with the material they'd be compelled to learn more about it and therefore find the booklet of use.

At this point we understand that the booklet reaches a level of high importance as it has to become a source of knowledge capable of luring the kids into experiencing it. Ergo bringing the role of the graphic design of the booklet into a featured place. As such, the layout of the booklet and the cover was carefully thought to captivate the user's attention through choice of lettering, layout and formal language.



fig 66 Booklet :  
Chapter III  
Source: Author

The result stands as a light and easy-to-read guide that allows the user to first interact with the material, be guided to learn and question its material's roots to finally explore different ideas and come up with is own.



fig 67 Booklet Cover  
Source: Author

## Validation

*"From the moment you know enough to talk about a product ... you know too much to be able to tell if the product would be usable for a person who doesn't know what you know." Barnum, 2011,p.9*

After the proper development of the product the next irrefutable step is to validate the conclusions reached in order to determine the level of appropriateness of the found solution and if the solution is ticking all the right boxes needed to successfully achieve the goals set. With that purpose in mind a usability test becomes essential to properly conduct a study capable of testing the effectiveness of the designed prototype and further test the appeal of the product in a "as close to reality" scenario. As such we must first comprehend what conducting a usability test means.

It is the researcher's understanding that usability test is a term associated with the planning of a study intended to test a product through a series of parameters in order to better assess its level of effectiveness and how the public or non-familiar with the project individuals react to it. Furthermore, it intends to ultimately get a better sense of the product actual impact should the product be placed in the market.

To understand the intricacy of conducting such a study, the researcher learned that usability test refers to "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use - ISO 92411-11" (International Organization for Standardization, 2008). Usability testing is further explained by Barnum (2011) as a way of providing the designer with access to users and allow in the user's themselves to tell the designer what they would do with the product, rather than it being the other way around.

To that end, we realise that it is in the research best interest to have such a test be held in the user's own home. It becomes clear that by reducing the level of the researcher's interference with the user's actions we are more able to get real honest feedback and ultimately understand how the product is perceived and approached by the user in its own environment. This provides a unique opportunity to understand how the environment that surrounds the user dictates its approach to the product and how influenced by it the user is.

### The usability test

Because this product is still under development we understand that according to Barnum (2011) there are two types of usability tests:

Formative testing: refers to a small usability test carried out during the stages of product development meant to shed some light on problems that need fixing and provide an understanding of the project's efficiency. This type of test can be conducted more than once during the project development stages and doesn't need statistical validity.

Summative testing: Is a formal test conducted after the project is finished and therefore it is a test made with a larger sample group it requires statistic validity.

Therefore we concluded that a formative testing is a more appropriate term to refer to the type of usability testing that we've carried out.

After making sense of what type of usability test needs to be carried out we find the need to define a user profile. As such we define a user as a kid with ages between 9 to 12 that is willing to explore a new material and learn something in the process.

After establishing the user's profile a selection of the sample group is required. This stage begins by understanding how many subjects a formative usability testing study actually requires. Thus different views on the matter are explored from which the views of Jakob Nielsen (2000) on the matter seem to recurrently be put forward. Thus, his view establishes that after testing a product with five users the chance of finding relevant information is very scarce concluding that we only need to test the product with a minimum of five users in order to get valuable information.

The early stages of planning the usability test included establishing that the test would be administered to six users with ages between nine and twelve and whom three would be girls and the other three would be boys in order to fairly evaluate the success of the product with the two genders. Secondly we established that the subjects would experience the kit over the course of a week in their own homes. Thus the role of the parents became vital to understand the subject's reaction to the kit.

As such, it was established that the kit was to be hand delivered to the parents, in order to limit the contact of the researcher with the subjects to avoid any biased behaviour. The moment of the delivery would also allow the researcher to brief the parents about what they should be attentive for in order to provide the researcher with an input from those who know the child better and ultimately hold a more realistic perception of the kids capabilities and difficulties.

The kit was successfully delivered to six kids three boys and three girls allowing the researcher to define the sample group:

Sample group - Usability test		
Subject	Age	Gender
1	12	Female
2	11	Male
3	10	Female
4	10	Female
5	11	Male
6	11	Male

tab. 17 Usability test sample group  
Source: Author

All kits were successfully retrieved allowing a proper analysis to be conducted.

## 1.1 Analysis

Based on the information retrieved via interview the following table presents the conclusions that we obtained.

	1F	2M	3F	4F	5M	6M
Personality	Shy but curious	Curious	Excited and extroverted	Was sick and a bit uncooperative	Very curious and excited	Very creative and excited
Level of excitement	Medium	High	High	Medium	High	High
Level of curiosity	Medium	High	High	High	High	High
Difficulties found	Lack of ideas	Hold the wicker twigs together and tie them at the same time	Controlling the "Liaga"	None	Controlling the "Liaga"	Hold the wicker twigs together and tie them at the same time
Likelihood of exploring more	Medium	Medium	High	Medium	High	High
Followed the booklet ideas	Yes	No	Yes	Yes	Yes	No
Read the booklet	Yes	Yes	Yes	No	Yes	No
Was able to follow instructions	Yes despite some confusion for lack of attention	Yes	Yes but there were some misinterpretations	-	Yes	-
Was interested in the booklet's content	No	Yes	Yes	No	Yes	No
Asked for help	Yes	Yes	Yes	No	Yes	Yes
Shared the experience	Yes	Yes	Yes	No	Yes	Yes
Shared a storytelling moment	No	Yes	No	Yes	Yes	Yes
Triggered their creativity	No	Yes	Yes	Yes	No	Yes
Would recommend the experience	Yes	Yes	Yes	Yes	Yes	Yes
Didn't understand...	The loops and Fixer	-	-	-	-	The loops
Wanted to keep the kit	Yes	Yes	Yes	Yes	Yes	Yes
Project made	Basket	Attempted to do a Dream catcher little experiments Picture frame	(attempted to do the basket but failed) Bracelet	Several little experiments	Basket	Boat
Happy with the amount of material	No, ran out of "Liaga"	Yes	Yes	Yes	Yes	Yes
Overall evaluation	Found the ideas easy and didn't come up with any of her own or the ones that she did come up with were discarded because she thought they were too easy	Was eager to make it work and was happy to count on his sister's help (the sister was 13 years old)	Was able to overcome difficulties and found creative solutions. Was excited to share the experience with her sister's boyfriend (16 years old)	Didn't seem excited but presented with the option to keep the kit jumped to the chance indicating that maybe she was more excited than what she was willing to admit. Didn't need the booklet's help and came up with her own experiments	The parent took over the project leaving the kid wanting to try more on his own. The test was seen as a task that needed to be fulfilled however that didn't take away the kid's excitement and interest in the kit	Immediately imagined a project and used the tools available had some difficulties but was happy to use the mom's help describing the experience with great joy.
Parents overview	Kids lack creativity because they are unfamiliar with the material. Added that perhaps there should be more difficult ideas and more variety	Found the experiment overwhelming to her kid but stated that it didn't take away is curiosity	-	Found the experiment good for her child as she is interested in such products sees her daughter doing more projects in the future	Found it too difficult for her to follow(the mom) Recognized that the kid was interested in doing more and found the kit adequate for him	Found the kit to be extremely adequate, recognize difficulties but was happy to experience the kit with the son

tab. 18 Usability test analysis  
Source: Author

## 1.2 Discussion of Results

Based on the gathered information we were able to assess that the kit was generally very well accepted as there wasn't one subject that wasn't curious and eager to work with the material given. As such we recognise that each subject had its own experience which most of the time reflected the use of an external person in order to assist them this situation is regarded as rather positive because it promotes the sharing of knowledge and experience. For one such need wasn't required which suggests that the subjects in question was able to work with the material on its own.

In regards to the materials we were able to conclude that the given portions of material were mostly adequate for those cases where the subjects found themselves wanting more material are link to the completion of the basket exercise which suggests that they only experimented with one type of wicker. Despite that being the case when interviewed these cases quickly suggested that they wanted to try different things but weren't sure or were misled into trying to do something harder which wasn't the purpose of the kit. The whole wicker wasn't always used which might suggest some concerns over the material

The tools were generally understood but in some cases weren't needed as different strategies were implemented by the subjects. This doesn't take away of the need for such tools because though some didn't use them others did and understood the need for them. There were however, recurrent complaints about the loops which were often seen as useless.

The booklet was perceived as adequate and well elaborated, however we understood that the most extensive part of the booklet was sometimes overlooked as the subjects were more interested in experimenting the material. Nonetheless, when interviewed some showed interest in learning more but felt that the week was too short for them to explore the content on their own.



## Iteration

*"...when problems are found in user testing (as they will most likely be) they must be fixed. This means design must be iterative: there must be a cycle of design, test and measure, and redesign, repeated until the usability objectives are met."*

*Userfocus, 2015, p.1*

Based on the reports of the subjects and their parents we were able to recognise that some changes needed to occur in order to better the found solution. We were able to understand the limitations of the product and proceed to suggest ways in which the product can be improved. As such, we proceeded to revise each component of the kit starting with the raw materials. As such, we found that the thickness of the wicker might have been part of the reason why some subjects didn't interact with it. Therefore we decided that the most thick measure should be abolished and the thinner wicker quantity should be superior. As for the "Liaça" some problems over the controlling of the material occurred suggesting that perhaps the material could be sliced in half in order to be less wide and therefore less strong, we also found that perhaps the length of the material might have been part of the problem. Nonetheless, "Liaça" was perceived to be favoured by the subjects for its possibility to be cut with a simple pair of scissors.

As for the tools, we found that the material chosen was adequate, however some tools were perceived as unnecessary and at times completely misunderstood, which begs the question of how necessary its use is. Therefore we decided to reduce the set of tools to those who were actually used and perceived as useful, which meant getting rid of the "C" shaped loops. The fixer of two holes was seen as useful in some cases and therefore we chose to add more to the set.

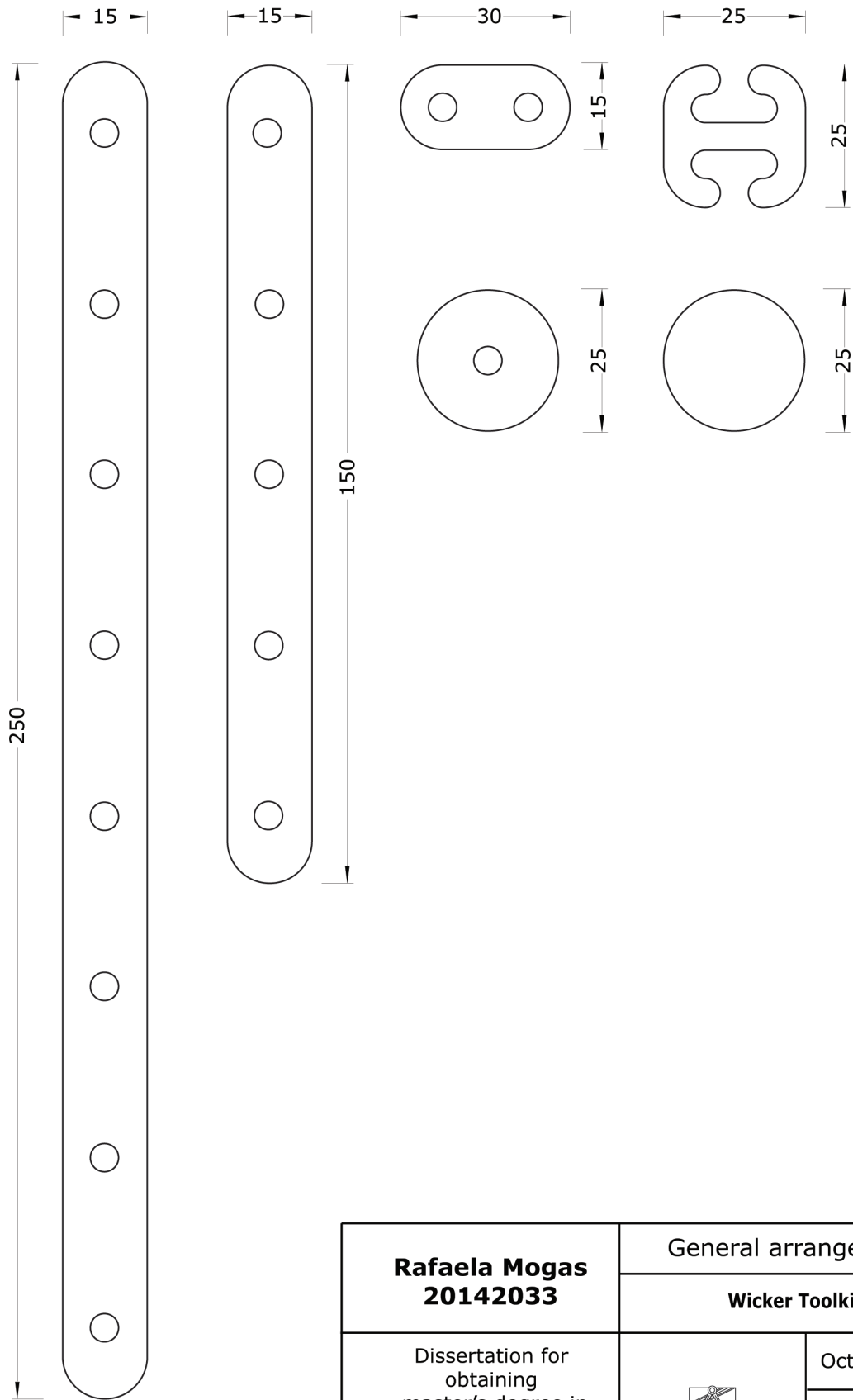
In regards, to the booklet it was found that it was very well received and represent no major issues. However we found the need to highlight the information over the preparation of the wicker by stressing the information regarding the need for the material to be soaked and pre-heated before being worked. We also, understood that there was a need to encourage kids to be creative and perhaps this encouragement could be further stressed in the last chapter where ideas are given.


In conclusion, we believe that would the implementation of the measures aforementioned a better product experience will be achieved further enhancing the results of this project.



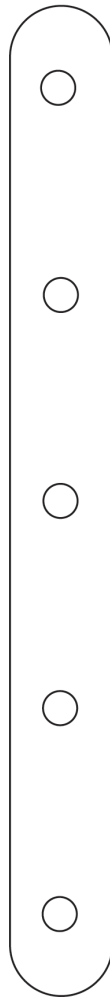
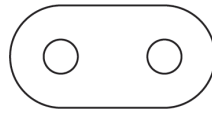
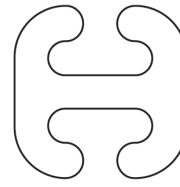
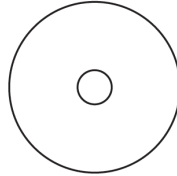
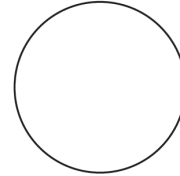
# **Technical Drawings**






<b>Rafaela Mogas</b> <b>20142033</b>	General arrangement	
	<b>Wicker Toolkit</b>	
Dissertation for obtaining master's degree in Product Design	 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016
		Scale 1:1
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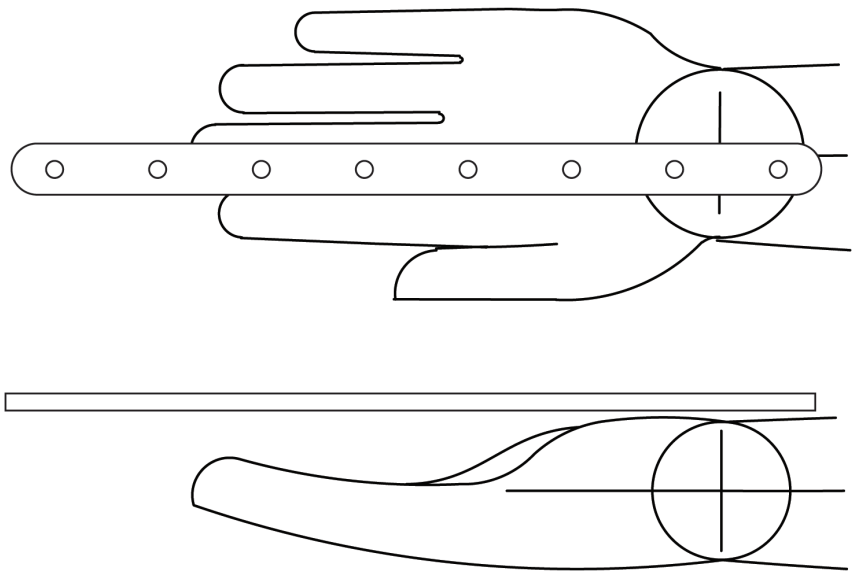
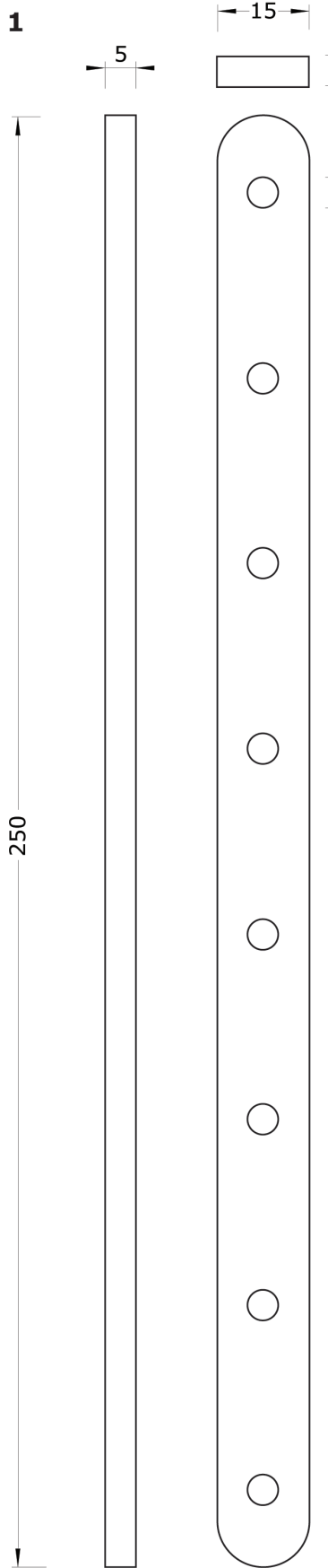


**1****2****3****5****4****6**


6	1	Breaker	Acrylic	9	Laser cut
5	8	Hook DB	Polyprop. 0.7mm	9	Laser cut
4	1	Breaker H	Acrylic	7	Laser cut
3	4	Fixer 2	Acrylic	7	Laser cut
2	4	Fixer 5	Acrylic	5	Laser cut
1	4	Fixer 8	Acrylic	3	Laser cut
Item	Quant.	Descrip.	Material	Draw.	Produc.
<b>Rafaela Mogas 20142033</b>			Map of components		
			Wicker Toolkit		
Dissertation for obtaining master's degree in Product Design			 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016	
				Scale 1:1	
<b>FA-UL 15/16</b>			mm	2/8	<b>2</b>



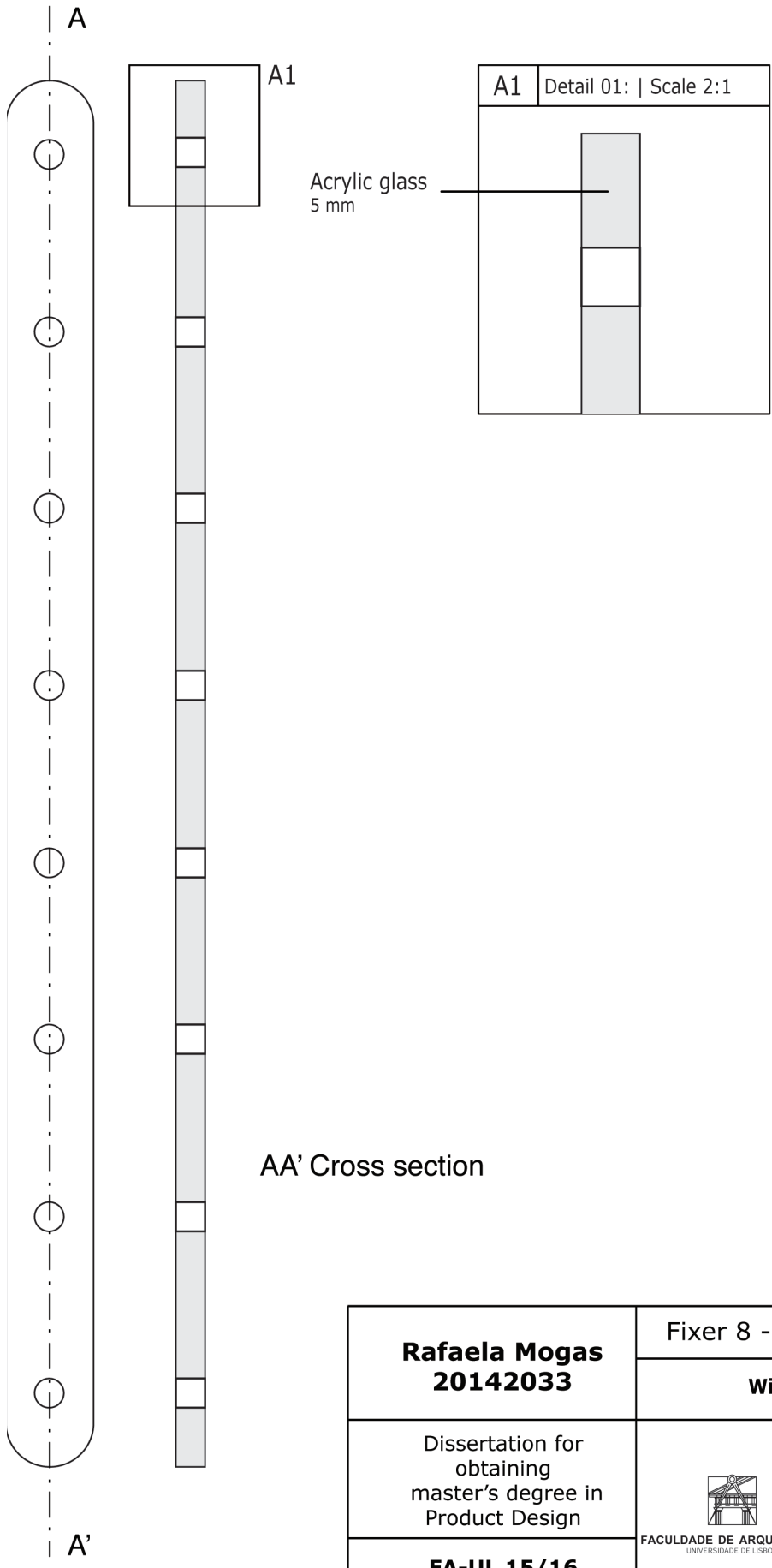





Percentile of an 11year old's hand  
Scale 1:2

<b>Rafaela Mogas</b> <b>20142033</b>	Fixer 8 - General arrangement	
	Wicker Toolkit	
Dissertation for obtaining master's degree in Product Design	 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016
		Scale 1:1
<b>FA-UL 15/16</b>	mm	3/8 <b>3</b>

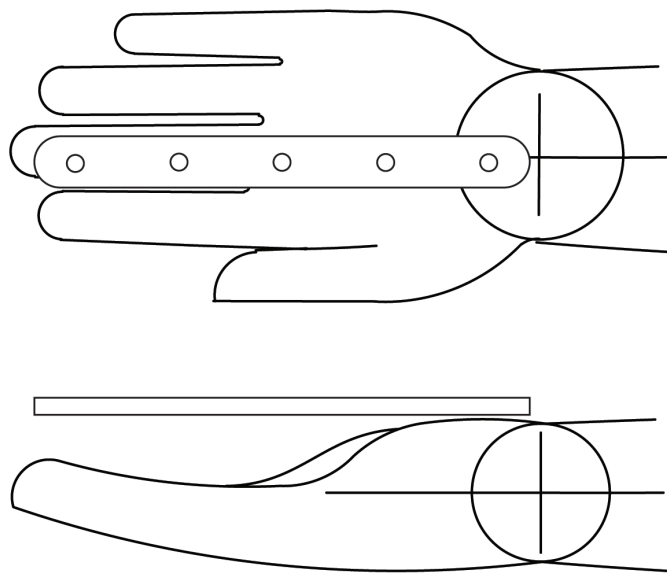
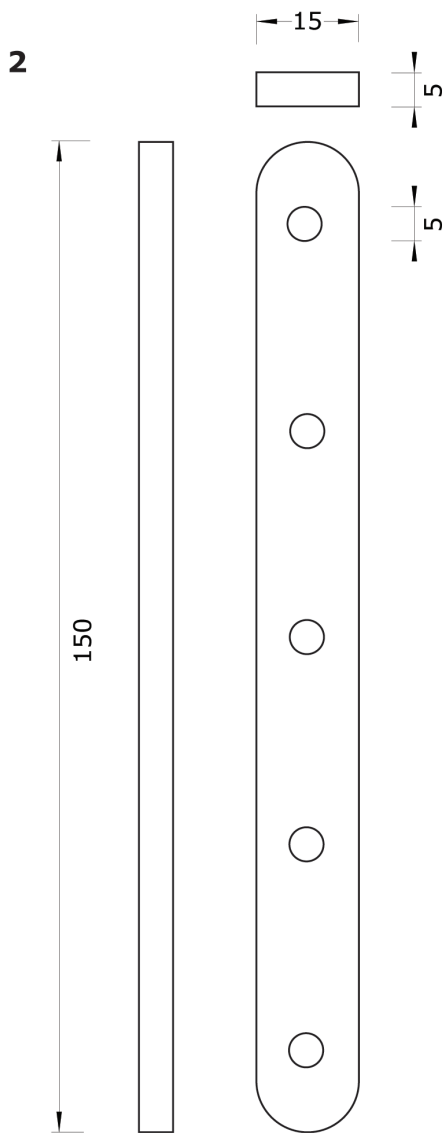




AA' Cross section


<b>Rafaela Mogas</b> <b>20142033</b>	Fixer 8 - Cross section A	
	Wicker Toolkit	
Dissertation for obtaining master's degree in Product Design	 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016
		Scale 1:1
<b>FA-UL 15/16</b>	mm	4/8 <b>4</b>



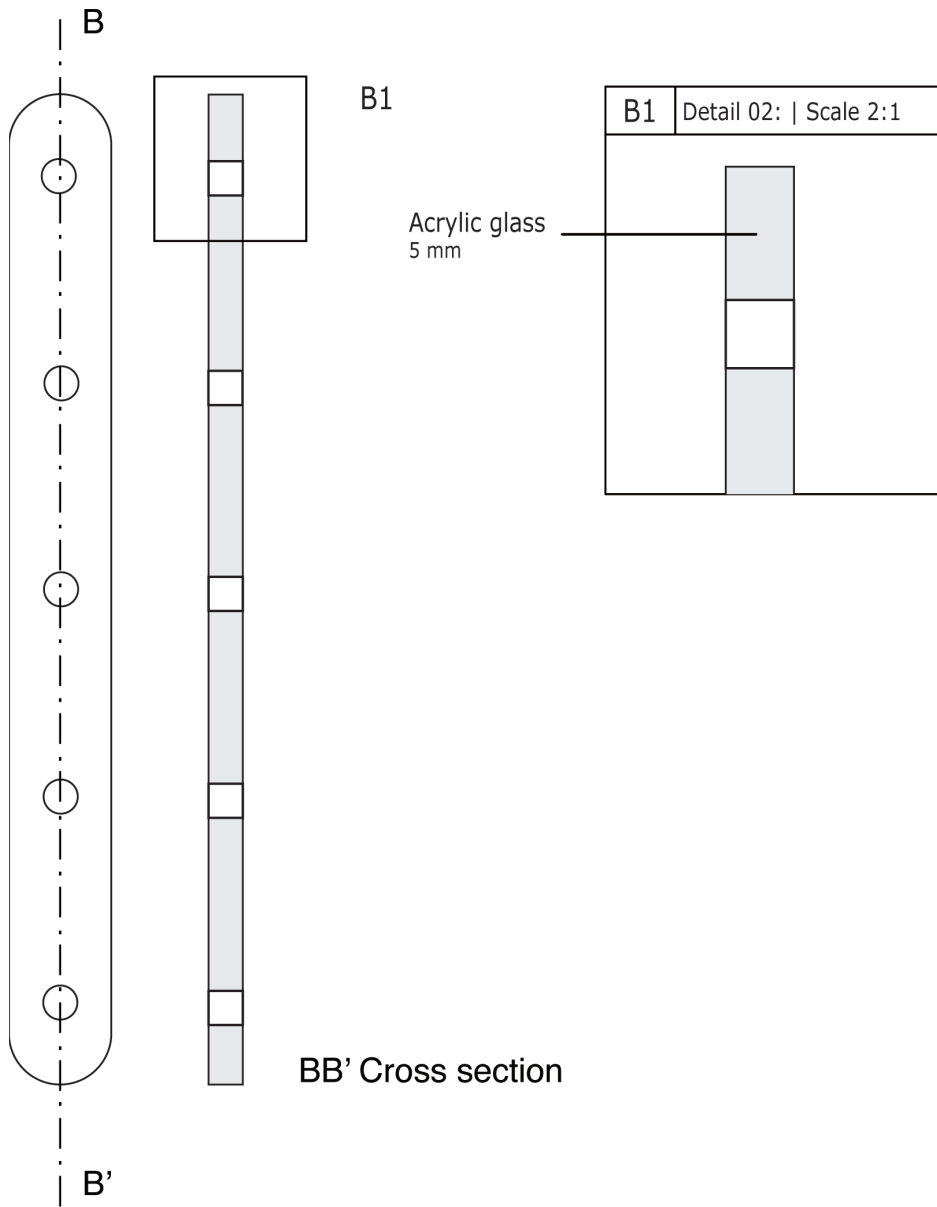



Percentile of an 11year old's hand  
Scale 1:2

Percentile human hand  
Scale 1:2

<b>Rafaela Mogas</b> <b>20142033</b>	Fixer 5 - General arrangement	
	<b>Wicker Toolkit</b>	
Dissertation for obtaining master's degree in Product Design	 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016
		Scale 1:1
<b>FA-UL 15/16</b>	mm	5/8 <b>5</b>

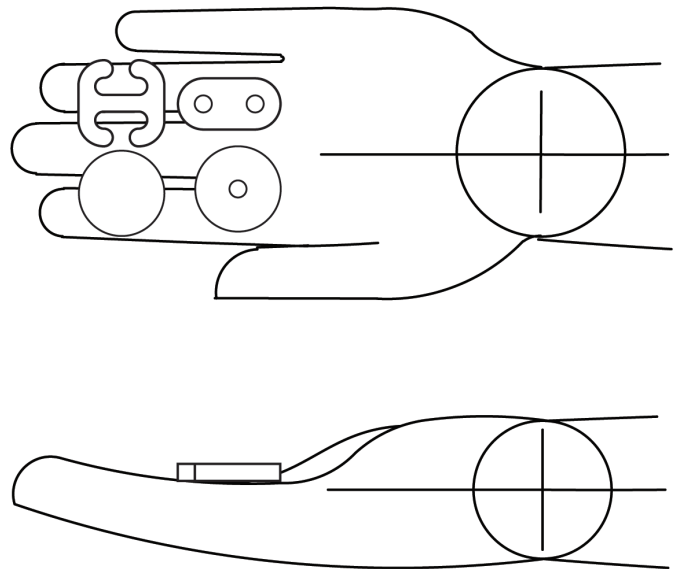
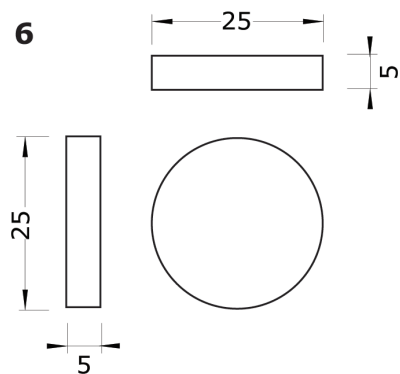
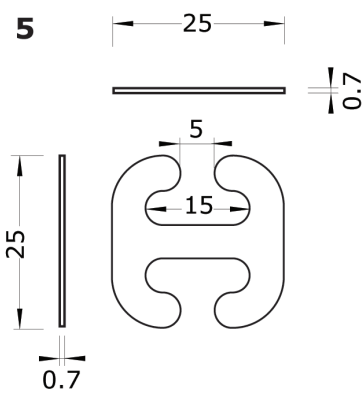
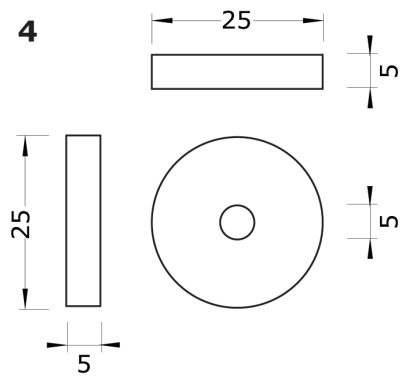
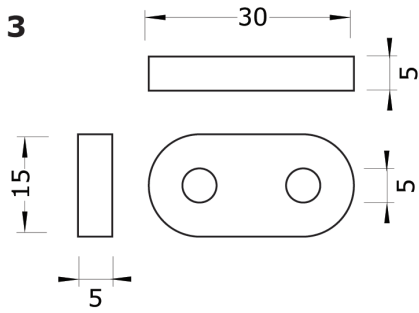





<b>Rafaela Mogas</b> <b>20142033</b>	Fixer 5 - Cross section B	
	Wicker Toolkit	
Dissertation for obtaining master's degree in Product Design	 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016
		Scale 1:1
<b>FA-UL 15/16</b>	mm	6/8 <b>6</b>



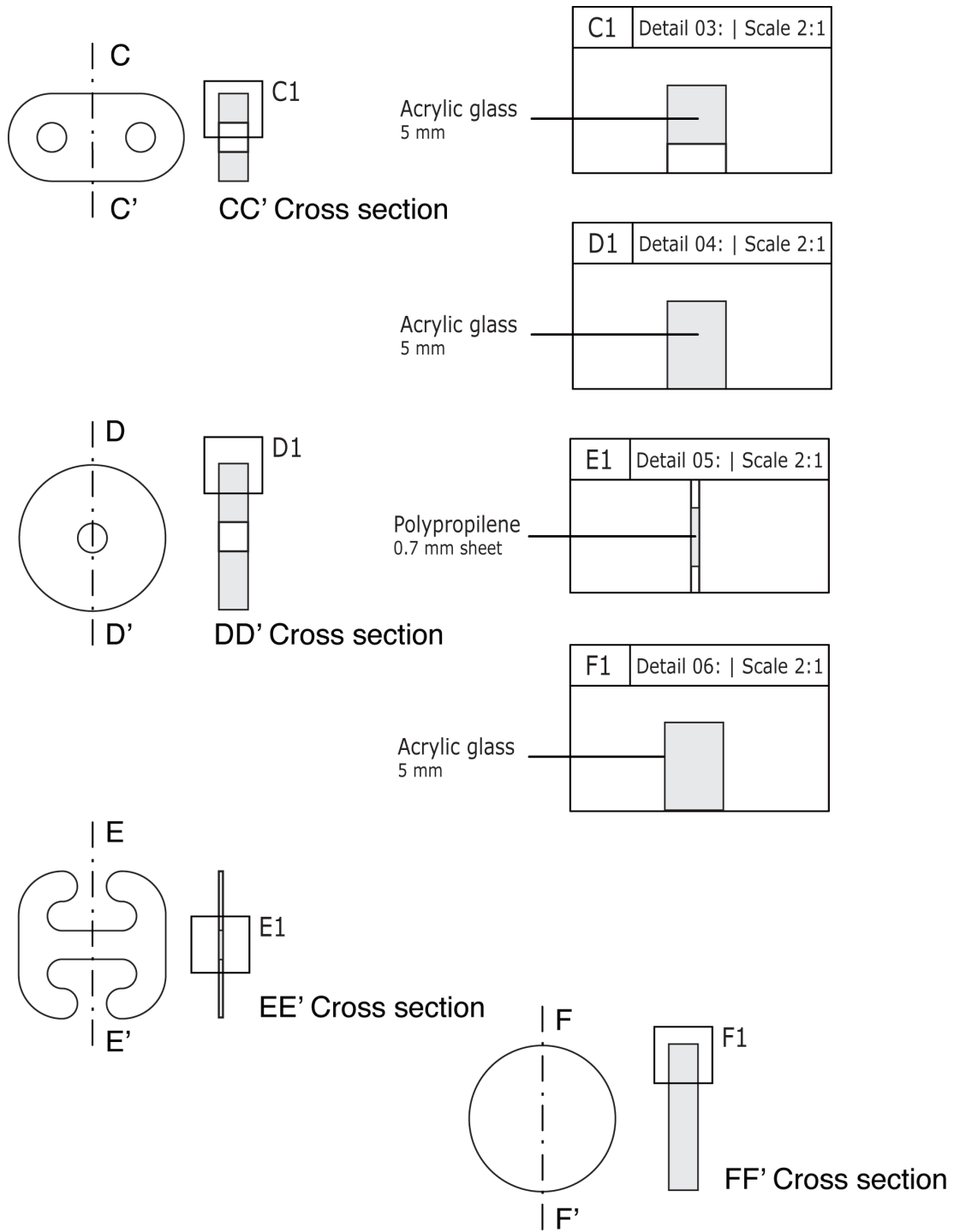





Percentile of an 11year old's hand  
Scale 1:2

<b>Rafaela Mogas</b> <b>20142033</b>	General arrangement of pieces 3 to 6	
	<b>Wicker Toolkit</b>	
Dissertation for obtaining master's degree in Product Design	 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016
		Scale 1:1
<b>FA-UL 15/16</b>	mm	7/8 <b>7</b>





<b>Rafaela Mogas</b> <b>20142033</b>	Cross sections C to F	
	Wicker Toolkit	
Dissertation for obtaining master's degree in Product Design	 FACULDADE DE ARQUITETURA UNIVERSIDADE DE LISBOA	October 2016
		Scale 1:1
<b>FA-UL 15/16</b>	mm	8/8 <b>8</b>



## Product tree

The following scheme summarizes the contents of the final product.

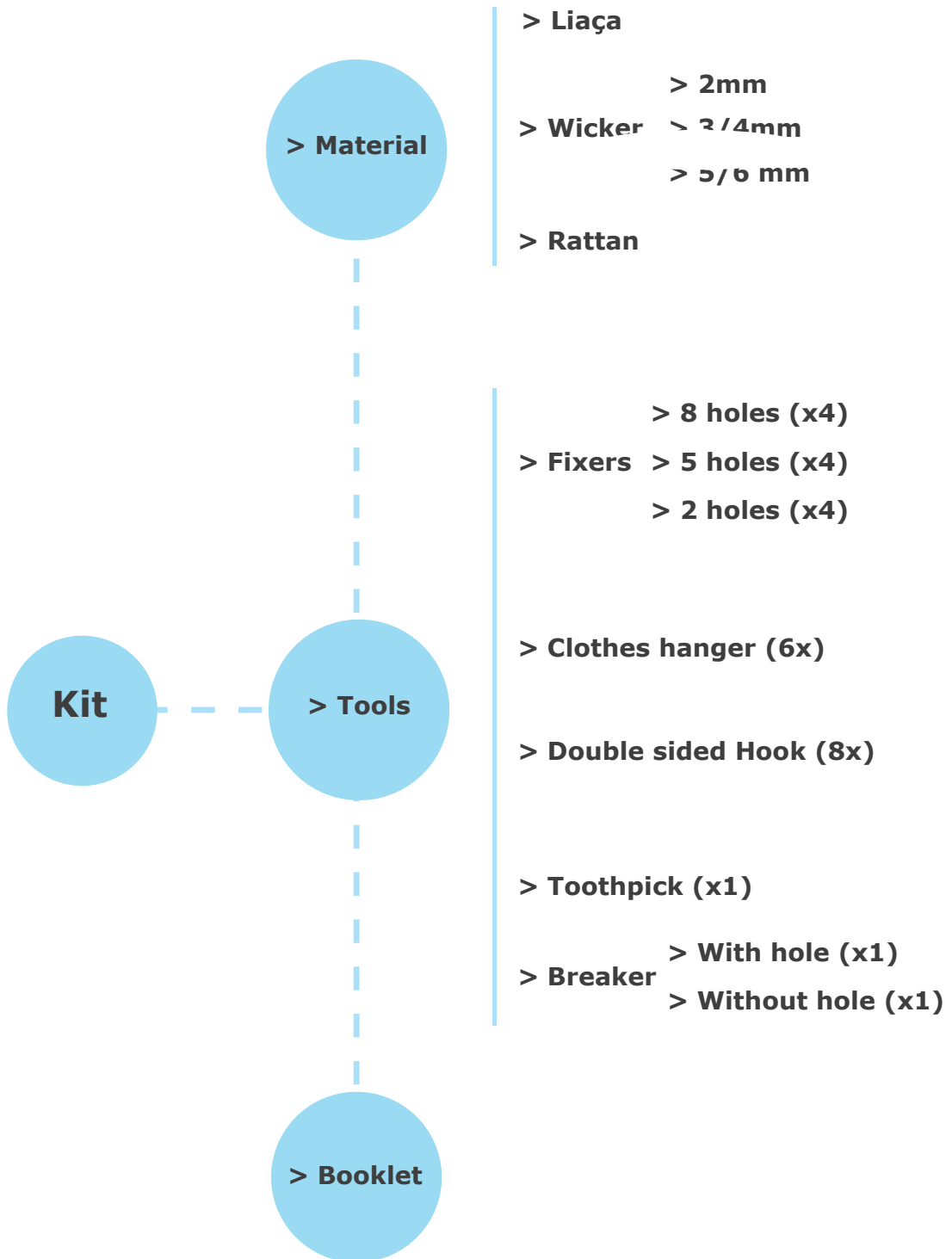


fig 68 Product's tree  
Source: Author



## Product's photos



fig. 69 Packaging  
Source: Author



fig. 70 Detail  
Source: Author



fig. 71 Full kit  
Source: Author





Part V:  
**Conclusions  
&  
Future Recommendations**



## Conclusions

With the end of this research we are able to affirm that by exploring User-centered design methods adapted to the pre adolescent child's needs we were able to successfully connect with them in a very early on stage. This dictated the focus of the research and ultimately its success. We can also conclude that Product Design has a definite part to play in the communication of meaningful forms of products to younger generations. It is especially able to do so through a product that is able to foment curiosity surrounding craftsmanship forms, while allowing the target to experience and explore on his own. Which is conclusively seen as a good strategy to be implemented with pre adolescents due to their eagerness to learn and experience on their own.

The usability test allowed us to conclude that the product was generally well accepted and fulfilled the set goals. We're able to say so by considering that it resulted in levels of usability and satisfaction that were quite satisfactory. If we add the iteration stage to the assessment we further believe that the kit possess the required characteristics in order to be implemented and help further enticing kids to explore a new material and learn about its background. This will help them to start being triggered into understanding the principles of craftsmanship forms and its meaning.

The final product was a combination of several stages of research and methodologies that ultimately helped avail the researcher with a better sense of the needs of the target and how the research questions could be answered, while still meeting the needs of the user.

It was, therefore, paramount to first understand the foundations of a meaningful product by understanding its affective component and what it comprises. By further assessing its link to key aspects such as national identity and focusing on the Portuguese identity we were able to accurately comprehend what a product of Portuguese Basketry entails. By completely understanding the meaning of such products we were able to further explore ways in which such findings could be passed on appropriately and according to the user's own capabilities.

Only by analysing each topic linked to the resolution of the problem were we able to achieve a methodological base of action. In the research held, we highlight the importance of understanding not only User-centered Design principles but the intricacies of dealing with a target that is specific and sensitive as well. Therefore, a need to further explore recently developed methods such as Child-centered Design became paramount in order to adequately, sensitively and effectively approach the target. Such methods were also found to need to be complemented by an understanding of the general characteristics from cognitive to social and physical skills of a pre adolescent child.

Thus, the active research phase was divided in four moments based on User-centered and Child centered Design approaches. This four moments began with a preliminary study that allowed to understand

the target's views on the subject, followed by the project development stage, where a product was developed based on the findings in the preliminary stage. The development stage was consequently followed by an evaluation stage where an usability test was conducted in order to help optimize and correct some aspects of the product that were later redesigned in the final stage, iteration.

At this point, we find it high time to highlight the importance of the research team's ability to establish a close line of communication with the target from the first stage to the last. This helped to consistently avail the researcher with a clear understanding of what the target needed and wanted from the product.

The consistent planning of each part of the preliminary study helped secure an approach bound to be able to give the researcher an holistic view of every aspect of the solution to the problem in each twist and turn. As such, the questionnaire first helped provide a general overview of a larger sample group over the habits and perceptions of the target. Though superficial, this first moment helped build the foundation of what type of information was still lacking. From that point on, we found that a need to hold a more holistic approach was vital. Thus the planning of a full generative experience began.

This experience began by having the participants fill out a sensitizing kit that helped the researcher understand, in a more personal point of view, how the target perceives their day-to-day life, what they like and don't like and how they process information regarding certain situations linked to the researched problem. The aforementioned, ended up building an understanding of what the target is and likes without the researcher having any close contact with the target, yet. This, ultimately helped not only with the building of an understanding of who the target is but also create a perception of how the target would react to the proposed exercises. The sensitizing kit was followed by two generative sessions. The first session provided a clear idea of what the target knows and feels about topics such as production, products and craftsmanship. Thus, this session ultimately helped the researcher understand in depth what information and opinion the target holds, which led to the start of the creation of a product strategy to help answer the research questions. The second session helped provide a clear understanding of what fine motor skills the target holds, how they engage with the material and what difficulties they found. This session ended up being crucial for the understanding of whether they would be able to interact with the material on their own, without the help of a moderator. The findings of this session were very promising which led to the compilation of a set of requirements that the product was due to achieve which culminated in the fruition of a DIY kit meant to help kids experience wicker and its background on their own.

The kit was a direct reflection of the found conclusions of the sessions, and because of it much care went into providing the user with an experience that would allow them to explore the material and their own creativity while learning more about how products are made, what the material is and what is its background. In this stage the need of finding a balance

between having them experiment with a product and having a proper set of instructions and ideas for them to try and accomplish was proven delicate. Because it was understood that not all kids would be able to immediately experiment with the material and develop something of their own, we found that by providing them with ideas we risked limiting their creativity as they would stop themselves from creating new solutions which. The result was a booklet that first enticed them to follow their creativity, then explore the material's background and later on experiment given ideas. Because this were kids we recognised that not all, if any, would follow the steps. Nonetheless, they would be given an unique opportunity to try something new and if curious learn something more about it and hopefully think about craftsmanship in a different way, which by the results in the usability test they ultimately were able to generally do.

Trough the usability test and by extensively analysing the found solution, further corrections were found of need and ultimately revised to provide the user with a better design solution.

We find at this point, of extreme importance to highlight the great enthusiasm of the sample groups of the preliminary stage that helped better the chances of obtaining an appropriate solution. And also the availability and enthusiasm of the sample group of the usability test which ultimately helped not only prove the rightness of the solution but also optimize the product and improve the user experience.

The following research helped prove that Product Design can go beyond the conception of products and therefore has far more potential to be achieved. We conclude by stating, that it is possible and relevant to explore affective Design examples through specialised User-centered Design methods for children of the preadolescent age. Because of it we were able to achieve a better understanding of the target group and ultimately a design solution able to connect with the needs of the user. We further add that it is imperative to understand that not only Product Design but the Design discipline is accountable for properly communicating the value of the products that represent our national identity to the younger generations further contributing to the preservation of such elements and overall sense of materiality.



## **Future recommendations**

This research helped establish a set of recommendations that may influence or direct future researches in the scientific areas, studied topics and adjacent subjects.

As such, we recommend that the researcher and designer must always strive to work closely to the intended target, going as far as including him in the process whenever possible. By doing so we will more quickly understand what needs to be done to reach an effective and useful solution that benefits the target and further contributes to the minimisation of the found problem. We focus on the importance of finding adequate forms of User-centered design methodologies for your specific target, which will help prevent common misconceptions and ultimately prevent waste of time and resources. We further recommend an attentive, careful and as realistic as possible planning of each stage of the research to make sure that each step makes sense and prevents the existence of loopholes. We admit that a strong research foundation is the premise for a solid decision making and fact checking process. We recommend that whenever working with children it is vital to avail ourselves with informants able to give us a clear sense of how to establish a degree of two sided communication with the target group and if possible include the informants in the planning stages. We also recommend that when working with children a sample group should be no bigger than 5 elements if conducting an activity alone, use the rule of five children to one adult at least.

We advise the use of generative sessions with children as a way to gather information in a more relaxed environment, without pressuring them to find a definite solution but actually helping them explore their own perceptions. This is a method that was based on different User-centered and participatory methodologies that was proven very effective due to the exploratory aspect of it, as kids often find themselves unsettled by the idea of being approach by an adult because of fear of being evaluated or failure. The strategy further helped them explore unfamiliar territory at their own pace and respond accordingly. We recognise that there is a lot of room to explore different ways in which Product Design can explore the relation of affective design and pre-adolescents, through the examples of craftsmanship and by employing user-centered approaches that weren't included in the chosen methods of this particular research.

In regards to the final product, we believe that it would be helpful to develop different lines of kits directed at more specific groups and interests. We believe that this would help focus the product and further segment it in order to reach more diversified groups and further secure its acceptance. We can further add, that it would be beneficial to add a more interactive component to the product by developing a set of workshops or school activities that would help better contextualise its content and further disseminate the product. And why not have a monthly meeting of craftsmen kids where the kids would be encouraged to show their designs and learn from other kids? We recognise that there could be the establishment of a craftsmen kids center where this sort of meetings and workshops could take place, this center could even be supported by entities already involved in such causes like craftsmanship associations and groups.





Part VI:  
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