

## Essential competences to fashion design practice for sustainability from the perspective of Design Thinking

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### Abstract

*The production and consumption of clothing products is characterised by rapid and continuous cycles of purchase, use and disposal of clothes, which leads to several environmental and social impacts. In order to change this reality and promote sustainability, this sector has to undergo deep transformations (Fletcher & Grose, 2011).*

*In this context, designers play a significant role. In addition to being in the position of decision-making about materials and methods used in the productive process, the questions raised by sustainability demand design skills (Brown, 2010; Gwilt & Rissanen, 2011; Fletcher & Grose, 2011).*

*However, the role reserved to fashion designers in this context is “more complex than traditional design activities” (Fletcher & Grose, 2011, p. 162). Design practice for sustainability demands different competences from the designer. In view of that, this paper explores the competences in design and fashion design for sustainability, and aims at verifying similarities and differences between them in order to analyse the knowledge inherent to sustainability through design thinking.*

*The methodology used for the study was deductive, conducted through qualitative exploratory research, outlined by bibliographic research and developed based on several books about design, fashion and sustainability.*

*The identification of the competences took four aspects into account: types of thinking, types of knowledge (know what to do and why), skills (know-how) and attitudes (be willing to do). Design and fashion design competences for sustainability were compiled separately and then compared for similarities and differences.*

*As a result, we found that great part of design competences are important for sustainable practices: approximately 58% of attitudes, 36% of thinking, 58% of knowledge and 41% of design skills are common to sustainable fashion design competences.*

*The comparison shows the importance of attitudes to the work with sustainability – once its addition was significant –, and the need of acquiring specific knowledge of fashion design for sustainability.*

*Research also shows that, for a professional with design competence, the development of thinking and skills needed for working with fashion design for sustainability is easier.*

**Keywords:** *Knowledge management, clothing sector, design, sustainability.*

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## **1. Introduction**

The production and consumption of clothing products is responsible for several environmental and social impacts. These impacts involve from the cultivation and extraction of raw materials to working conditions, cultural identity preservation and clothing maintenance (Salcedo, 2014).

Sustainability poses criticism to the clothing sector, because it is a production and consumption system characterised by rapid and continuous cycles of purchase, use and disposal of clothes. Due to its current structure, the clothing sector has to undergo deep transformations towards sustainability (Fletcher & Grose, 2011).

However, the fashion industry still ignores the transformative nature of the system proposed by sustainability, opting for small settings of operational character (Fletcher & Grose, 2011). But how to transform this reality? According to Brown (2010) and Fletcher and Grose (2011), the issues raised by sustainability require the use of design skills.

Although the design activity is aligned with the needed requirements for a more sustainable production system, the role reserved to the fashion designer in this context is "more complex than traditional design activities"<sup>58</sup>, since the transition to a more sustainable scenario implies systemic discontinuities (Fletcher & Grose, 2011, p. 162; Manzini & Vezzoli, 2010).

In order to investigate the core competences needed to fashion designers for the practice of design for sustainability, this paper aims to identify types of thinking, types of knowledge, skills and attitudes that help them in this practice. To identify these aspects, we explore the competences in design and fashion design for sustainability through bibliographic research, verifying similarities and differences between them, in order to analyse the knowledge inherent to sustainability through design thinking.

In Section 2, we present the literature review about the challenges of sustainability, particularly the challenges posed to fashion designers. Next, in Section 3, the concept of competence is defined and we present how the design thinking approach is related to design competences. Section 4 concerns the research method adopted, while Section 5 presents separately the research results regarding the competences in design and fashion design for sustainability. In Section 6, we present the results analysis and discussion. The final considerations are made in Section 7.

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<sup>58</sup> “[...] mais complexo que as atividades de design tradicionais [...]” (Fletcher & Grose, 2011, p. 162, our translation).

## 2 Challenges of sustainability

Sustainable development can be defined as:

systemic conditions under which, at the regional and global level, human activities should not interfere with the natural cycles that underlie all the resilience the planet allows and, at the same time, should not impoverish their natural capital, that will be passed on to future generations (Manzini & Vezzoli, 2010)<sup>59</sup>.

However, not only does sustainable development consider the environment, it also requires "integrated and balanced analysis"<sup>60</sup> of different perspectives: economic, environmental, social, cultural and political (Fornasier, 2011; Queiroz, 2014; Vezzoli, 2010). The basic assumption is the need for a radical transformation to create a production and consumption system "profoundly different from what is practiced today"<sup>61</sup> (Vezzoli, 2010).

According to Capra and Luisi (2014), the main problems of our times – whether economic, environmental or social – are interconnected and interdependent. They are systemic problems that show a perception crisis and demand a radical change in thinking and values, as shown in Figure 1.

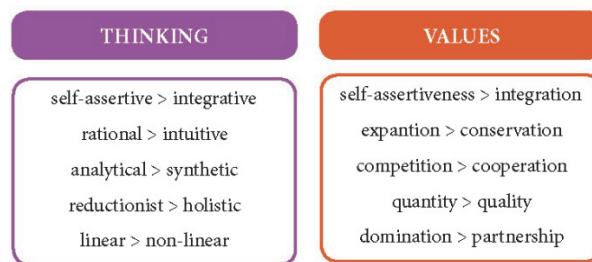


Fig. 1 Change of thinking and values. Source: adapted from Capra & Luisi (2014, p. 38)

Systemic thinking – which proceeds through relationships, patterns and contexts – is at the center of this perception change. This is a contextual thinking that deals with complexity, a concept "associated with systems composed of several parts or agents, highly interconnected"<sup>62</sup> (Bezerra, 2011).

This type of thinking is important to face the challenges of sustainability, since "environmental destruction is a complex system by itself; it is widespread and has deeper causes that are difficult to see and understand"<sup>63</sup> (Braungart & McDonough, 2011).

### 2.1 Fashion and sustainability: designer's responsibility and challenges

In order to achieve sustainability, all fashion industry must undergo improvements, not only some life cycle phases, such as choice of raw material (Fletcher & Grose, 2011). After all, there are many environmental and social impacts caused by the fashion industry, especially since the advent of fast fashion.

<sup>59</sup> "Condições sistêmicas segundo as quais [...]" (Manzini & Vezzoli, 2010, p. 27, our translation).

<sup>60</sup> "análise integrada e balanceada" (Fornasier, 2011, p. 138, our translation).

<sup>61</sup> "[...] profundamente diferente daquele que se pratica hoje" (Vezzoli, 2010, p. 32, our translation).

<sup>62</sup> "[...] associado a sistemas formados por várias partes ou agentes, extremamente interconectados" (Bezerra, 2011, p. 39, our translation).

<sup>63</sup> "[...] destruição ambiental é um sistema complexo por si só [...]" (Braungart & McDonough, 2011, p. 70, our translation).

Designers can play a significant role in this scenario. They are in a position of making decisions regarding materials and methods used in the production process (Brown, 2010; Gwilt & Rissanen, 2011). Not surprisingly, Benyus (2015) believes that "maybe design is the most powerful lever to move the economy and culture towards a more sustainable society"<sup>64</sup>.

In this context, the role of the fashion designer is to seek solutions to the challenges posed by sustainability (Salcedo, 2014). However, for fashion designers to commit to sustainability, they need to know the strategies of design for sustainability: if they do not know what the strategies are, how to apply them and the possibilities they offer, they will not be likely to change their design process to create more sustainable solutions (Gwilt, 2011).

### 3. Competence: knowledge, skills and attitudes

For a professional to be considered able to perform certain activities, they need competence. This means they need to present the knowledge (head), skills (hands) and attitudes (heart) specific to this task (Durand, 1998, 1999 apud Vieira, 2002).

Knowledge corresponds to *knowledge itself*. It refers to all knowledge accumulated by the person throughout life. There are five types of knowledge, presented in Figure 2 (Fornasier, 2011; Demarchi, 2011).

According to Durand (1997, 199 apud Vieira, 2002), skills relate to *know-how*. It is the ability to perform a task and apply the acquired knowledge – which, in this sense, corresponds to knowing what to do and why. This is a characteristic related to tacit knowledge (Fornasier, 2011).

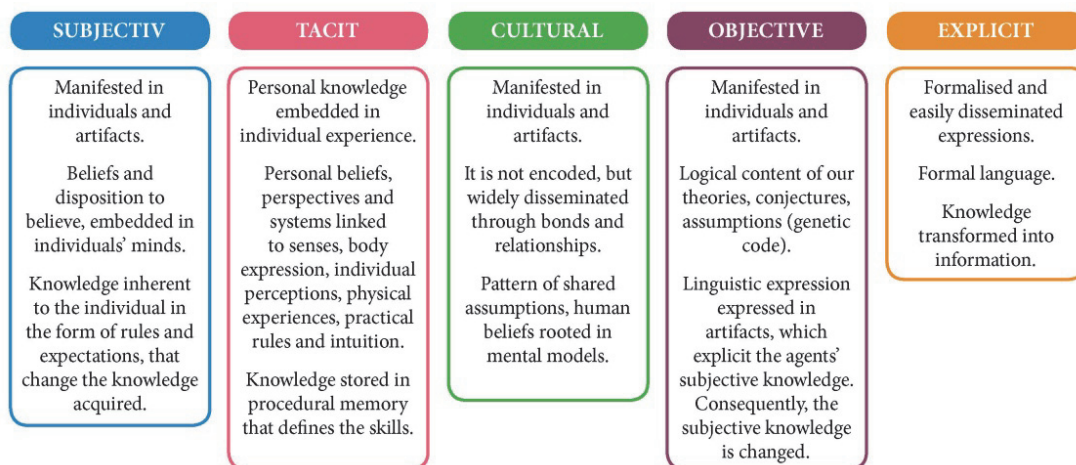


Fig. 2 Types of knowledge. Source: adapted from Fornasier (2011, p. 138)

As pointed out by the literature review conducted by Vieira (2002), attitudes are complex conditions that affect behaviour, producing it or explaining it. It relates to *be willing to do*. According to Fornasier (2011), attitudes correspond to "learnt predispositions, judgment, values, or individual beliefs that determine the course of action or the behaviour", being "embedded in the subjective knowledge"<sup>65</sup>.

<sup>64</sup> "[...] talvez o design seja a mais poderosa alavanca para mover a economia e a cultura na direção de uma sociedade de maior sustentabilidade" Benyus (2015, p. 284, our translation).

<sup>65</sup> "[...] predisposições aprendidas, juízo de valores, ou crenças individuais que determinam a maneira de agir ou o comportamento [...] embutida no conhecimento subjetivo" (Fornasier, 2011, p. 158, our translation).

### **3.2. Design thinking: design knowledge, skills and attitudes**

Related to design competences is the design thinking approach, which uses design's ability and sensibility to "visualise problems and concepts, develop scenarios and build strategies based on designers' research methods"<sup>66</sup> (Demarchi, Fornasier & Martins, 2010).

Design thinkers use a different type of logic – abductive – through which they seek a balance between deductive and inductive logics to better understand the world (Fornasier, 2011). While the deductive logic (related to "what should be") draws conclusions from general to specific, and the inductive logic (related to "what is efficient") parts from the specific to the general, the abductive thinking is the logic of "what could be" (Martin, 2010).

Other types of thinking are commonly associated with design practice, such as divergent thinking – which multiplies the options for creating choices through the acquisition of knowledge –, and convergent thinking – which decides among existing alternatives (Fornasier, 2011; Demarchi, 2011).

There are two other types of thinking: systemic and integrative. The former – explained earlier in Section 2 – is considered by Cardoso (2013) as the largest and most important design's contribution to meet the challenges of our complex world. Meanwhile, integrative thinking is the very essence of design thinking: it is the ability to see non-linear and multidirectional relations as a source of inspiration, keeping several opposing ideas in tension to reach new solutions (Brown, 2010).

## **4. Method**

In order to identify the competences needed by designers to the practice of fashion design for sustainability, and to verify similarities and differences between the competences in design and fashion design for sustainability, we used the deductive method conducted through qualitative exploratory research, outlined by bibliographic research, which allows us "to identify the current state of knowledge on the subject"<sup>67</sup> (Gil, 2010).

The research was developed based on several books about design, fashion and sustainability. First, we compiled design competences, then, competences in fashion design for sustainability. Both were compared to find similarities and differences.

## **5. Results**

### **5.1. Competences in Design**

To become a design thinker, it is necessary to develop the personal knowledge system (Martin, 2010). This system consists of three elements that are mutually reinforcing: posture (attitude), tools (which indicate knowledge and types of thinking required) and experience (where the skills come from).

According to Martin (2010), attitudes profoundly influence action and guide the choice of what knowledge to accumulate. Accumulated experience is the result of the knowledge and attitudes acquired. The experience forms tacit and objective knowledges and allows improvements on skills and sensitivities, which feed back posture (attitude) and can modify it.

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<sup>66</sup> "[...] visualizar problemas e conceitos, desenvolver cenários e construir estratégias baseadas nos métodos de pesquisa dos designers" (Demarchi, Fornasier & Martins, 2010 p. 5, our translation).

<sup>67</sup> "[...] a identificação do estágio atual do conhecimento referente ao tema" (Gil, 2010, p. 30, our translation).

The thinking, knowledge, skills and attitudes typical of design thinkers are highlighted in Figure 3. We elaborated it based on the following authors: Brown (2010), Martin (2010), Demarchi (2011), Fornasier (2011), Mozota (2011) Bezerra (2011), Cardoso (2013) and Margolin (2014).

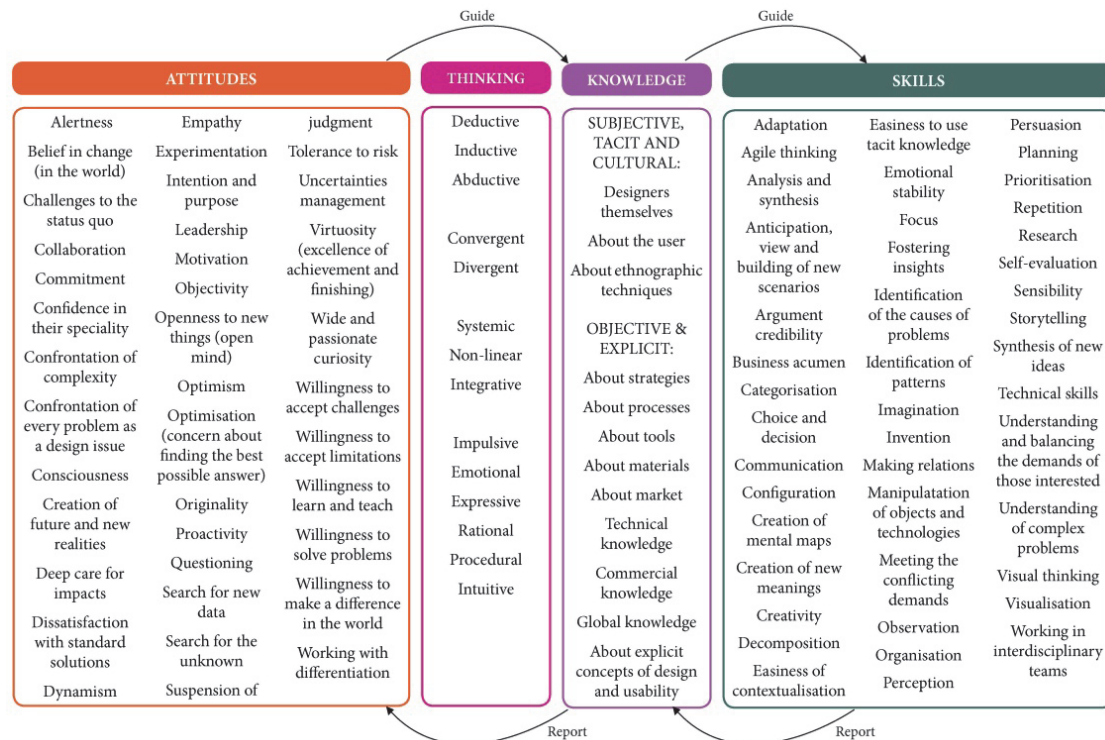


Fig.3 Competences in design. Source: based on Brown (2010), Martin (2010), Demarchi (2011), Fornasier (2011), Mozota (2011) Bezerra (2011), Cardoso (2013) and Margolin (2014).

## 5.2. Competences in Fashion Design for Sustainability

We compiled the essential competencies for the practice of fashion design for sustainability in works that approach sustainability, design for sustainability and sustainable fashion: Benyus (2015), Braungart and McDonough (2013), Brown (2010), Capra and Luisi (2014), Cardoso (2013), Fletcher and Grose (2011), Gwilt (2014), Queiroz (2014), Salcedo (2014) and Vezzoli (2010). The result of this literature review is presented in Figure 4.

The theoretical review reinforces the need to develop new competences. Sustainability implies, from the fashion designer's part, "a new attitude when making design decisions"<sup>68</sup> (Salcedo, 2014). It also requires a radical change of perception and thinking patterns (Capra & Luisi, 2014; Fletcher & Grose, 2011).

<sup>68</sup> “[...] uma nova atitude na hora de tomar decisões de design” (Salcedo, 2014, p. 89, our translation).



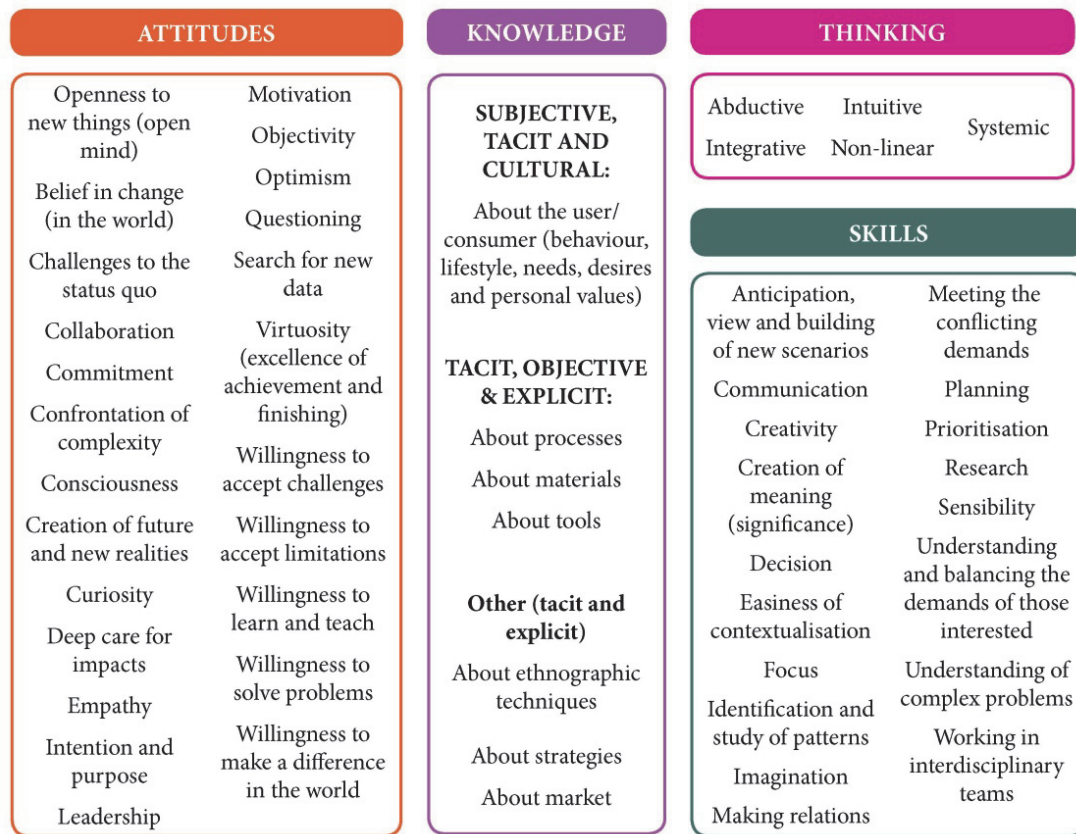


Fig. 5 Convergence between competences in design and fashion design for sustainability

We notice that, if on the one hand, most of the design attitudes are necessary for the practice of fashion design for sustainability, on the other hand, fashion design for sustainability requires a much wider range of attitudes, which influence the actions and decisions of the designer, boosting them to work with sustainability. Regarding design thinking, not all types of thinking relate directly to sustainability, but some of them are essential, such as systemic, intuitive, integrative and non-linear. However, other types of thinking are added to competences in fashion design for sustainability: synthetic, holistic and strategic.

While design knowledge identified in Figure 3 can be considered more generic, the knowledge necessary to the practice of fashion design for sustainability – shown in Figure 4 – is more specific, encompassing various design for sustainability theories and concepts. In common, there is the need to know deeply the product user or consumer, as well as knowledge regarding processes and materials – which include knowledge of impacts and more sustainable alternatives. Also, in common, there is the knowledge of tools, adding design tools for sustainability into design thinking tools.

Regarding skills needed for the practice of fashion design for sustainability, many are similar to design skills, as few are added to these. Among the common skills, we highlight those related to systemic thinking: understanding complex problems, easiness of contextualisation, creating relationships, identifying and studying patterns.

The comparison between competences in design and fashion design for sustainability reveals the importance of attitudes to work with sustainability, since the addition of attitudes was significant. As mentioned in Section 3, attitude is related to *be willing to do*, it influences the action and the acquisition



of knowledge. Therefore, we can say that working with sustainability in fashion demands more attitudes from designer, involving stronger predispositions, values and beliefs.

Equally significant is the increase of knowledge, justified by the indication of specific knowledge regarding fashion design for sustainability, while design one presented in Figure 3 was generic. We notice there is lot of knowledge to be acquired for the practice of fashion design for sustainability, that will influence design decisions, since it relates to knowing what to do and why.

On the other hand, the research shows fewer skills are needed to fashion design for sustainability, compared to design ones. We consider important to note that nearly half of skills for sustainability are also design skills. Considering that they are the result of acquired attitudes and knowledge, we can say that, once the designer is willing to work with sustainability and seeks the needed knowledge, they will be able to easily develop the skills needed through design for sustainability practice.

## **7. Final considerations**

Sustainability poses a challenge to the fashion industry because of the structure this system has, as we mentioned in the Introduction. In order to deal with that, Brown (2010) and Fletcher and Grose (2011) believe design skills can contribute to the issues raised by sustainability.

Because of this, this article aimed to identify the essential competences for the practice of fashion design for sustainability and compare them to the competences in design, verifying similarities and differences between them.

In Section 2, we saw that sustainable development requires radical changes in behaviour and in the way we understand how the world works. Designers can play an important role in this change, since they make decisions related to materials and methods used in the production process and can influence the development of more sustainable lifestyles.

For fashion designers to be able to develop more sustainable products, they must be competent for this activity. As discussed in Section 3, this means that they need to provide specific knowledge, skills and attitudes to this task, meaning that fashion designers need to add new competences to the design competences.

Identifying the design competences through literature review was the first stage of the research presented in this paper. For this, our starting point was the desing thinking approach, which is related to design competence, since it uses the design sensitivity and skills. As design thinking also involves designers' way of thinking, we also considered types of thinking as part of design competences.

After the second stage, in which we identified competences in fashion design for sustainability, the results were compared, which allowed us to analyse the knowledge inherent to sustainability through design thinking.

The results confirm the convergence of the issues raised by sustainability and design competences. They also show that sustainability requires new competences from fashion designers.

The research highlights the importance of attitudes to work with sustainable fashion and the need for knowledge acquisition related user/consumer, materials and production processes, as well as design tools and concepts for sustainability.

It also shows that, for a professional with expertise in design, it is easier to develop thinking and skills necessary to work with fashion design for sustainability, since few elements are added to these factors, as compared to attitudes and knowledge.

Our study would thus enhance the importance of design thinking and knowledge and competences management to allow fashion designers to be able to transform the fashion system towards sustainability.

Given the limitations of the research presented in this article, since it was based solely on theoretical sources, we consider it necessary to advance the study and examine the relevance of the competences identified in theoretical basis in the practice of fashion design for sustainability. We believe that the practice of fashion design for sustainability investigation can present new competences, as well as new convergences between the competences in design and fashion design for sustainability.

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