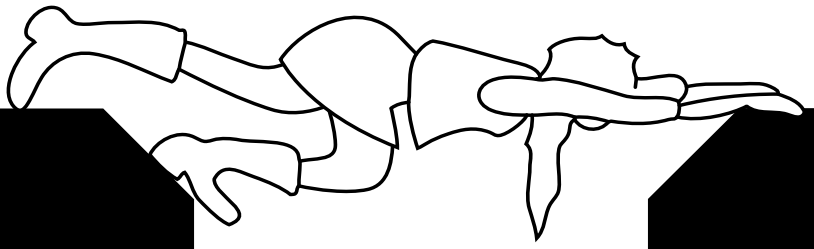
Crossing Cultural Chasms

towards a culture-conscious approach to design

Annemiek van Boeijen



Crossing Cultural Chasms

towards a culture-conscious approach to design

Proefschrift
ter verkrijging van de graad van doctor
aan de Technische Universiteit Delft,
op gezag van de Rector Magnificus Prof. Ir. K.Ch.A.M. Luyben
voorzitter van het College van Promoties,
in het openbaar te verdedigen op vrijdag 13 februari 2015 om 15:00 uur

door
Annemieke Geertje Christine VAN BOEIJEN
ingenieur Industrieel Ontwerpen
geboren te Tholen, provincie Zeeland in Nederland

Dit proefschrift is goedgekeurd door de promotor
Prof. Dr. P.J. Stappers

Copromotor
Dr. Ir. F.E.H.M. Smulders

Samenstelling promotiecommissie
Rector Magnificus, Technische Universiteit Delft, voorzitter
Prof. Dr. P.J. Stappers, Technische Universiteit Delft, promotor
Dr. Ir. F.E.H.M. Smulders, Technische Universiteit Delft, copromotor
Prof. Dr. P.V. Kandachar, Technische Universiteit Delft
Prof. Dr. H.M.J.J. Snelders, Technische Universiteit Delft
Prof. Dr. A.P. Hardon, Universiteit van Amsterdam
Prof. Dr. P.A. Lloyd, University of Brighton
J. Fulton Suri, IDEO design consultancy

Contents

Preface 7
How to read this thesis 8

C 1 **11**
'Raison d'être'
'En route': determining research questions and an optimal approach

1.1 Designers dealing with culture 12
1.1.1 Early lessons from mismatches in design practice 12
1.1.2 Cultural questions in personal design practice 15
1.1.3 Experiences in design education 18
1.1.4 Conclusion 20
1.2 Staging the research 21
1.2.1 Goal 21
1.2.2 Boundaries of the study's context 22
1.2.3 Research questions and approach 25
1.2.4 Researcher's role 29
1.2.5 Expected results 30

C2 **31**
What is to be found in theory?
Models and theory from the disciplines of cultural anthropologists and design

2.1 Cultural anthropology – Existing models and methods 33
2.1.1 Culture defined 33
2.1.2 Culture manifested 38
2.1.3 Cultural dimensions – Models to typify culture 43
2.1.4 Other cultural theories 45
2.2 Design – Existing models and methods 48
2.2.1 Models for dealing with culture in design 48
2.2.2 User-centred design methods 52
2.2.3 Cultural values in design 59
2.2.4 Importance of culture-conscious design 61
2.2.5 Reflection and stance 63
2.3 Conclusion – A first-stage framework for culture in design 63
2.3.1 What did we find in the literature? 63
2.3.2 A first-stage framework 63
2.3.3 From theory to empirical reality 66

C3 **69**
What is to be found in practice?
Towards insights geared to help designers deal with culture-related aspects

3.1 Research approach – General outline **71**
3.1.1 Studied cases – Five sets 71
3.1.2 Researcher's role 73
3.1.3 Data and analyses 73
3.2 Research methods – Further details of five sets of cases **75**
3.2.1 Case set 1 – i.do workshops (i.do) 75
3.2.2 Case set 2 – Joint Master Project cases (JMP-BoP) 79
3.2.3 Case set 3 – Graduation Projects cases (GP-BoP) 82
3.2.4 Case set 4 – Graduation Projects (GP) 85
3.2.5 Case set 5 – Context & Conceptualisation essays (C&C essays) 86

3.3 - 3.6 Results and discussion – Three categories of findings (Section 3.3, 3.4, 3.5, and 3.6) **88**

3.3 Designers' reasons for studying the culture of intended users **89**
3.3.1 Matching the design with intended users 89
3.3.2 Utilitarian and cultural values 92
3.4 Lens used by designers to determine their own cultural values and to delineate the cultural group **94**
3.4.1 Designers' lens – What is cultural specific and what not? 94
3.4.2 The role of the designers' own cultural values 96
3.4.3 Delineation of the cultural user group 97
3.4.4 Designers' focus, and understanding of culture, is influenced by team dynamics and project stakeholders' backgrounds 100
3.5 Designers' need to tune their research methods to the culture of intended users **102**
3.5.1 Participatory design methods 102
3.5.2 Dedicated design tools 109
3.5.3 Non-participatory design methods 112
3.5.4 Designers influenced by their own background 114
3.6 Discussion and conclusions **115**
3.6.1 A lens to help designers examine culture 116
3.6.2 Guidelines and content for the design tool 117
3.6.3 Issues to address in another empirical research step 119

C4 **121**
Insights from investigations
Moving from a first-stage to a second-stage framework

4.1 Research approach – General outline **122**
4.1.1 Evaluation of cultural models in C3 cases 123
4.1.2 Probing in design courses 124
4.1.3 Researcher's role and research methods 130
4.1.4 Data collection and analysis 131
4.2 Results and discussion **131**
4.2.1 Hofstede's onion model 132
4.2.2 Hofstede's dimensions 134
4.2.3 Other cultural models 137
4.2.4 Conclusions – Tuning the onion model and reconsidering the dimensions 138
4.3 Towards socio-cultural dimensions **139**
4.3.1 Additional models to typify culture 139
4.3.2 Goal and guidelines for the development of cultural dimensions 144
4.3.3 Socio-cultural dimensions in design 144
4.4 Discussion and conclusion **147**
4.4.1 A second-stage framework 147
4.4.2 Guidelines and content for development of the design tool 149

C5 **151**
Design tool – Crossing Cultural Chasms
A set of cards to help designers develop a culture-conscious approach

5.1 Design approach **152**
5.1.1 Design goal, guidelines, and criteria 155
5.2 Concept 1 – Result of the first iteration **156**
5.2.1 Concept 1 156
5.2.2 Evaluation of Concept 1 157
5.3 Concept 2 – Result of the second iteration **159**
5.3.1 Concept 2 159
5.3.2 Investigation and evaluation of Concept 2 161
5.3.3 Discussion and conclusions 169
5.3.4 Five intentions regarding a culture-conscious approach to design 170
5.4 Final Design **176**
5.5 Discussion and conclusions **180**

C6 **181**
What we have now
Contribution to design theory, future research, design education, and design practice

6.1 Reflection on the main research question – Value of the findings **182**
6.1.1 Framework 183
6.1.2 Tool – The Crossing Cultural Chasms Card Set 186
6.1.3 Additional insights 187
6.2 Reflection on the research approach **189**
6.2.1 Limitations 189
6.2.2 Further study 191
6.3 A culture-conscious approach in design education **194**
6.4 In the end **196**

Summary 197
Samenvatting 203

References 209
References – Cases 221

Glossary 226
Abbreviations 233

Appendix 1 – Cases 234
Appendix 2 – Summary of Stage A publications 237
Appendix 3 – Card set: design criteria 242
Appendix 4 – Cultural dimensions 245
Appendix 5 – JMP-BoP and GP-BoP cases questions 246
Appendix 6 – JMP-BoP cases questionnaire 249
Appendix 7 – Card set questionnaire 252

List of publications 258
Curriculum Vitae 261
Acknowledgements 264

Colophon 266

Preface

Whenever I am in conversation with people doing research on culture within the context of design, they usually begin by stating that the topic is huge and multi-faceted.

They might then embark on stories involving a wide variety of subjects that seem related to what we call culture. Some refer to various customs encountered during holidays abroad, and describe with pleasure or even disgust their new experiences as to what people in other cultures eat and how they behave.

These experiences often appear to be a source of fun and inspiration, but people sometimes share their frustrations as well, or at least express an opinion about specific practices with which they are not familiar, or that are not in keeping with their own values. In this context, they might refer to music, dance, film, paintings, and other art-related expressions of culture.

Among designers, the conversation moves in all directions. It covers, for example, different design styles related to the visual appearance of products for specific user-groups, as well as experiences involving cultural issues encountered in international design teams and companies. At times, the discussion turns to whether we overestimate the importance of cultural differences, and whether designers would be better advised to concentrate on the universal principles we share as human beings.

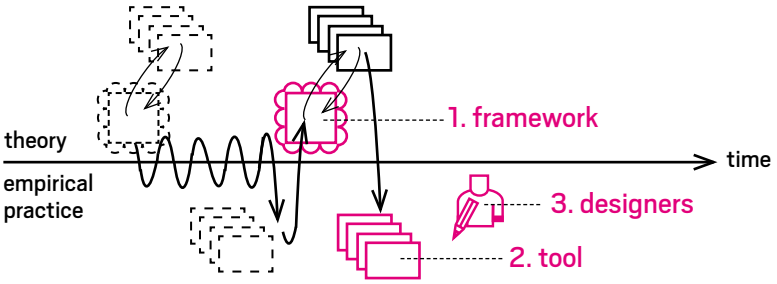
Discussions like those mentioned above, along with my 23 years of experience with cultural issues in the practice of design, led to a keen desire to explore the topic in order to understand more fully the complex and multi-layered phenomenon of ‘culture’, and to determine how designers might understand the concept as well, and benefit from this knowledge. With the research for this thesis, my primary aim was to gain a deep personal understanding of the concept of culture within the design discipline. My secondary goal was to help designers to consciously avoid mistakes when confronted by cultural chasms in their projects, as well as to create something meaningful for people everywhere.

The final result is a framework and a tool that provides designers with a finely adjusted lens to examine more effectively the culture of their intended users, and ultimately to implement the newly found possibilities into their designs.

How to read this thesis

Guidelines

The purpose of this thesis is to provide readers with an overview of the research and the findings, conducted and achieved within the boundaries of a PhD and in the context of design education.
The aim of the research result is to help designers – as defined in this thesis – to understand the culture of their intended users. Insights are based on studies of the literature, on the study of a large number of cases from international design projects, and on investigations of theoretical models applied in an educational design setting. The resulting framework serves as a lens to examine culture, and as a tool to help designers deal with the culture of their intended users during the design process. The tool – a set of cards – can be found on www.designandculture.info. A digital version of the thesis is also available via this site.
Throughout the thesis, the focus alternates between theoretical and empirical practice, as illustrated in the figure below. The three key elements are highlighted: (1) development of the theoretical framework, (2) development of the tool, and (3) intended users of the tool, who are the designers.



Chapter 1 describes the reasons and a justification for the research. It starts with several product examples of the design practice, followed by the aim of the research, and ends with research questions and an appropriate research approach.

Chapter 2 presents findings from the literature in the fields of cultural anthropology and design, leading to a first-stage framework to study culture.

Chapter 3 presents research approaches and findings from studied cases, leading to guidelines for the design of a tool and a finely tuned lens to examine culture.

Chapter 4 focuses on the deeper investigations regarding elements of the framework, leading to a second-stage framework.

Chapter 5 describes the development of the design tool, the set of cards.

Chapter 6 reflects on each of the findings described in this thesis; how it contributes to theory, future research, design education, and to the design practice.

Many terms used here may have diverse connotations or definitions in various disciplines. In order to cross the cultural chasm between the research cultures of different readers of this thesis, a glossary is included to clarify the meaning of terms used in the context of this research.

References to reports of the studied cases in the text have their own style, and are introduced in Chapter 3. Full references can be found in Reference Cases. Other references in the text are in APA style.

C1 ‘Raison d’être’

‘En route’:
determining research questions
and an optimal approach

This first chapter describes the reasons and a justification for the research presented here. It starts with several product examples that illustrate, for different reasons, how designers deal with the notion of culture in their conceptions. This first exploration results in questions and in determining the context of this thesis and its boundaries. The chapter subsequently characterises the targeted designer and design activities that are to be supported by the research results. It ends with a description of the research questions, approach, and expected outcomes. The study begins with examples of cultural barriers and questions that emerged from the practical reality (empirical practice) (see Figure 1.1), and moves via these questions to theory that has been used to develop a feasible research approach.

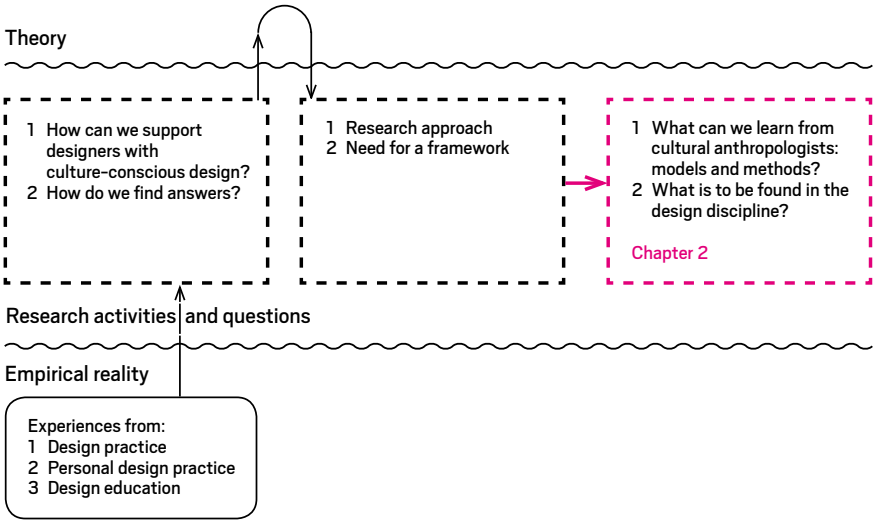


Figure 1.1 Overview of research activities presented in this chapter

1.1 Designers dealing with culture

For various reasons, designers encounter barriers or concerns that are related to the culture of their intended users. Examples from professional design practice, from my own design experience, and from design education are introduced below.

1.1.1 Early lessons from mismatches in design practice

When users perceive or use products in a way that is totally different from what the designer expected or intended, this can sometimes be recognised as a barrier caused by a disparity between the culture of the designer and that of her or his target users. The examples below illustrate the different kinds of mismatches that designers might encounter, but also the opportunities that barriers might bring.

Different commonly held values leading to different material
The design of the water purifier shown in Figure 1.2 is based on a technical principle initiated by the Dutch company DSM, and developed further in cooperation with Philips Domestic Appliances and a Dutch graduate student of IDE[1] (Kandachar et al., 2009, p.99).

waterpurifier (DSM)

stainless steel household products in rural Indian context

Figure 1.2 Stainless steel water purifier for India (Kandachar et al., 2009, p.99)

To the designer's surprise, the first concept design for application in rural Indian households was not acceptable to the intended users. Even though in an economical sense the quality of the applied material, plastic, was a cheap alternative to the stainless steel solution, the users still preferred stainless steel. They perceived plastic to be an inferior and non-hygienic material. The design team had overlooked the commonly shared value that 'good-quality household products should be polished to a shine', which itself is based on 'cleanliness is next to Godliness'. A shining stainless steel utensil is believed by Indians to be clean.

Different social values leading to different interactions
PicoSol is a Dutch foundation that supports small-scale solar power for rural areas lacking electricity, and its aim is to initiate affordable and sustainable solutions, developed in close cooperation with local communities. The foundation introduced a solar-powered water pump in Ghana and West Papua (see Figure 1.3).

The pump enables people to have access to clean water, and helps women – who spend many hours each day carrying water from remote wells – to save time and to ease their work load. Water pipes run from the pump to the village, where

[1] IDE: Faculty of Industrial Design Engineering at the Delft University of Technology

Figure 1.3 A solar pump provides clean water to a village (PicoSol, 2014)

several taps are in place. In Ghana, the taps are locked, and are managed by one person, who is in charge of payment. In West Papua, the taps can be used freely. The community wanted a collective system in which every family should contribute to the system equally. In principle, the needs in both cases are the same, but the final designs are different, because communities differ in how they value a water supply – whether as something to share or to consume individually.

Separated family roles leading to exclusion of intended users

Siemens (Honold, 2000) reported another example of local aspects that are related to culture in design.

Figure 1.4 An example of a washing machine manual, written by Graham Dixon, 1999

In India, the female head of the household usually operates the washing machine. However, she is not supposed to carry out the regular replacement of a dust filter, because instructions for replacing the filter are under the heading 'maintenance', which is an activity directed to men. The designers of the manual did not think of using the word 'operation', which would have increased the acceptability of the activity being carried out by a woman. This example illustrates how the understanding of a culture-specific value, such as the way that specific groups deal with gender roles, would contribute to the design of a product that would be used as intended.

Collective use leading to new product ideas

One of the observations about the use of mobile phones in India was that many people shared their mobile phones with family members and friends (Lindholm et al., 2003), whereas the mobile phone had been designed originally for individual use.

Figure 1.5 Mobile phone user (left) and the Nokia study (right) (Lindholm et al., 2003, pp.102-106)

This sharing has led to the notion of designing multiple address books in one mobile phone, so that each user can have his or her personal contact list. Indeed, this idea may be interesting not only for Indian users but also for other cultures, and the example illustrates that comparing usage between cultures can lead to new product ideas.

1.1.2 Cultural questions in personal design practice

The projects discussed below are from my own design practice. The racing wheelchair and tricycle project demonstrate how cultural aspects were not taken consciously into account. In contrast to the mismatches described in Section 1.1.1, these examples do not indicate clear mismatches but issues that raise questions about the extent to which one can take culture into account in practice.

A minor role for cultural aspects involving racing wheelchairs

In 1990, for the Dutch company Veldink BV, I designed a racing wheelchair for athletes attending the Paralympics. It was one of the first racing wheelchairs with three wheels and with an advanced composite frame (see Figure 1.6).

Racing wheelchairs in 1990

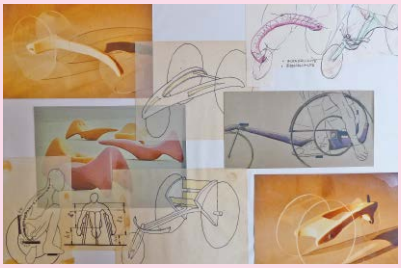
New racing wheelchair

New one with user

Figure 1.6 Racing wheelchair design (van Boeijen, 1990)

The innovation was driven by the novel possibilities for functionalities, properties, and forms offered by newly available materials and production techniques. The final design was based largely on ergonomic specifications, competition rules, technological possibilities, and the aim of standardising production to keep costs as low as possible. Furthermore, all these issues were at variance with the designer's own perspective and aesthetical notions: namely, the tricycle and its user should form *a natural unity and express speed*. For the determination of the form, the metaphor of a flying swan was used. The culture to which the wheelchair users belonged was barely examined, except for the specification of colours; the selection was based on a collage made with visuals regarding sport-related products current at the time (see Figure 1.7).

Collage of design styles in sport



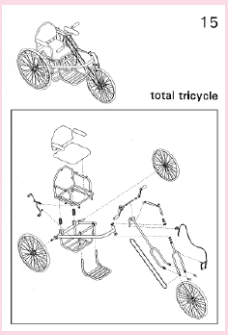
Form study for the new design

Figure 1.7 The selection of colours was based on those at the time (left); the form was based on the designer's wish to express 'natural speed' (right)

Can a universal hand-operated tricycle exist?

Another example was a project involving hand-operated tricycles. Together with a Dutch team, and in close cooperation with tricycle-producing organisations in India, Sri Lanka, Thailand, and Vietnam, I worked on the development of a hand-operated tricycle (see Figure 1.8).

Prototype of the 'universal tricycle'



Page from the manual
(van Boeijen et al., 1996, p.15)

Figure 1.8 A prototype of the 'universal tricycle' and a page from the tricycle-production manual

The project approach (published in van Boeijen, 1996, cited by Oosterlaken, 2009, p. 99) was challenging, not only because of the cross-cultural cooperation, but because of the design goal. Each tricycle design (from each organisation, see Figure 1.9) supported the same utilitarian values, needs, and functions, but the properties and forms – for example, different propulsion systems, weight, and colours – differed substantially.

India

Sri Lanka

Thailand

Vietnam

Figure 1.9 Each manufacturer and nation has its own tricycle design

However, the aim was to develop a novel design that would break all functional records, that would be easier for its users to operate, and that could be

manufactured and maintained using locally available materials, production facilities, and skills. Therefore, thorough analyses were made of a wide range of existing tricycle designs from both Western and non-Western nations. Stability, manoeuvrability, weight, and other properties were measured and compared. Ergonomics were studied to understand the optimal propulsion characteristics, and all findings were combined and incorporated into a list of requirements, resulting in an improved tricycle design (see Figure 1.8) that was published in a production manual (van Boeijen et al., 1996). The result was intended to be a universal design (discussed in van Boeijen, 2007b, pp. 112-119), but despite all the improvements, the organisations that had participated in the project were not motivated to adopt it. The users seemed to be satisfied with their existing designs, even if the tricycles were almost too heavy to operate. The question arose as to whether acceptance of a new design by its manufacturers and its users would simply be a matter of time. Or had we overlooked something? Did we fail to bridge a cultural chasm? The goal of this research was to find answers. We come back to this example in Chapter 6.

1.1.3 Experiences in design education

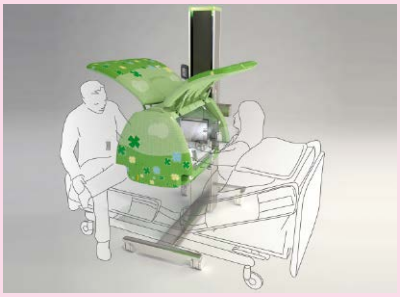
It is also interesting to look at design education because – in the context of the research at hand – many of the international projects in design education constitute a rich source of learning material.
Due to the expanding possibilities of communicating and travelling between nations, a growing number of design students are conducting international projects, and more and more of them study abroad. Here, we distinguish three categories.

Culture in international projects
In these projects, design students are involved in projects for companies developing products that will be used by people in different cultures: for instance, for multination companies but for national companies as well. An example of this is the Dutch company Driessen, which manufactures airplane rest cabins that are used by crews from all over the world.

Culture in international workshops
A growing number of design students attend workshops abroad or in their own country, where together with students from other countries and design schools they work for several weeks on a design project. These projects are often embedded in the courses.

BoP product: HEBI is a baby incubator designed for rural hospitals. The incubator, heated with lamp bulbs and with a simple membrane for moisture control, costs little and is easy to maintain.

Designed by Oscar Van Hemel, 1968 (Hebi-incubator, 2014)



ToP product: Babybloom is a baby-, parent-, and caregiver-friendly incubator. The access of the parents to the baby is as immediate as possible, in order to protect and nurture the bond and to enhance the baby's development.
Designed by Heleen Willemse, 2012 (Babybloom, 2014)

Figure 1.10 Two incubators: one for the base (left) and one for the top (right) of the economical pyramid

Culture at the Base of the Pyramid (BoP)

There is a growing interest in Base of the Pyramid (BoP) projects[2]. In these projects, the cultural gap between the designer and his or her intended users is usually large, mainly because these design projects involving the economically poorest people in the world are situated in countries and regions with which most designers are not familiar. This lack of familiarity leads to uncertainty about the applicability of design research methods (e.g. do they function as intended?) and the acceptability of designs by intended users (e.g. do users like to use the products as intended?).

As part of the research, a substantial number of the cases studied concern BoP projects. However, although culture seems to be an important factor to be taken into account by outsiders supporting people living in a BoP context, the developers of the BoP concept do not indicate how culture could or should be taken into account.

The BoP concept was first introduced in 2002 by the economists C.K. Prahalad and Stuart Hart, and was presented in a book three years later (Prahalad, 2005)

[2] The term BoP projects is used in the IDE-Delft and therefore applied. It refers to the group of people who live in developing countries – and was appropriated by the designer and researcher Gui Bonsiepe with regard to people living in 'the periphery' or in 'peripheral countries' (Fathers, 2003).

and adopted by researchers in the design discipline (Kandachar and Holmes, 2008; Gupta, 2010). BoP refers to the majority of the world's population – those who earn less than two USA dollars purchasing power parity (PPP) per day. Most products are designed for users at the top of the world's economic pyramid (ToP), and are not appropriate for the majority of the world's population: namely, those people at the base of the pyramid (BoP). ToP products are too expensive or not accessible, and/or additives, such as batteries or chemicals, are not available for BoP users. Figure 1.10 shows a BoP and a ToP version of a product with the same basic functions but with different sub-functions and forms.
ToP products are often not adaptable to local BoP possibilities. Prahalad and Hart posit the idea that this large population has been neglected too long and should be included in the world's formal economical system. Karnani (2007) states that the only way to alleviate poverty is to raise the purchasing power, and that there are only two ways to do this: (1) by lowering the *prices* of goods and (2) by raising the *income* of the poor. For *price* reduction, he suggests three strategies: (1) reducing profits, (2) reducing costs without reducing quality, and (3) reducing costs by decreasing quality. *Income* can be raised by entrepreneurship, but he argues that most people lack the skills, vision, creativity, and persistence to be true entrepreneurs. Creating labour is in his opinion the best option, by upgrading people's skills and productivity and by creating possibilities for employment. In my opinion, designers could contribute to the first strategy by designing low-cost products, and to the second by creating business. Karnani also stresses that poverty cannot be defined only by economic terms, but that '*…we need to improve their capabilities and freedoms along social, cultural, and political dimensions as well*' (Karnani, 2007, p.39). He makes a convincing argument for taking cultural aspects into account. However, he does not explain how culture can be incorporated into the design development, or discuss the nature of outsiders' roles in this respect.
A third strategy: designing new and good-quality products that are appropriate to the local situation, matching cultural values or supporting cultural change.
In line with this, Botzepe (2008) proposes four aspects: (1) tapping into tradition; (2) addressing local problems; (3) building pride in local identity; and (4) adopting what has been learned from others.

1.1.4 Conclusion

The examples illustrate various barriers and uncertainties that designers may encounter as a result of cultural differences. They demonstrate how products that fulfil the same basic needs may differ in form in order to address different social and cultural values. The water purifier example shows that a collective meaning regarding household products steers the designer's selection of material. The example of the solar pump demonstrates how differences between community values lead to different designs in terms of user interactions. The washing machine example highlights the designer's lack of awareness concerning the influence of gender roles on product usage. The mobile phone study shows that different social behaviour can lead to ideas regarding new product development.

With respect to the racing wheelchair, the example demonstrates that cultural aspects were not taken into account at a conscious level, but were based on connotations related only to the visual appearance of the racing wheelchair.
The cultural gap between the designer and users of the hand-operated tricycle was much greater. The tricycle case highlights the difficulties involved in bridging cultural chasms. Cultural aspects were not considered consciously, and it was not clear whether it would have been effective to strive for a universal design or to what extent culture should have been taken into consideration.
The BoP incubator illustrates the different cultural contexts within which designers work, and show that these have led to different solutions.
The question now is whether the anecdotal examples are what we have to accept as normal, or can we learn simply from practice? Is there a microscopic-type lens suitable to investigate culture, and a systematic way of reasoning to help designers limit their blind spots and avoid mismatches? How can we help designers bridge the cultural chasms between themselves and their intended users? And what in fact is a culture-conscious approach to design?

1.2 Staging the research

The introduction so far describes situations in which designers need to deal with cultural differences involving their intended users. The examples underpin the intention of this thesis to support designers as regards culture-conscious design. Before delving into the research questions, however, some boundaries are needed to determine the key elements to be examined. In this section, the research goal, boundaries, and definitions are set. In addition, the questions and the kind of expected results are discussed. This chapter ends with a description of the research approach, the methods, and the means to find answers.

1.2.1 Goal

The goal of the research is twofold. On the one hand, the aim is to help designers regarding a culture-conscious approach (contribution to the design practice), while on the other hand, the goal is to generate knowledge as to how cultural aspects play a role in product design (contribution to the body of theory).
Consequently, the results will be a tool aimed at supporting culture-conscious designers, as well as a framework to examine culture in design. Furthermore, the research results in insights into the barriers, solutions, and opportunities as regards incorporating culture into the design practice. This is in addition to a deeper look into relationships between results of the study and theories found in the literature.
The focus of the research is characterised by some key components (see Figure 1.12). The *researcher* [0] needs to know the *context of the designer* [a] and of the *cultural context of the intended users* [b] in order to develop the *tool* [3] and its *intended usage* [2] . The *designers* [1] – the intended users of the

tool that needs to be designed– need to devise a *product* [4] appropriate for their *intended users* [6], which means that the interactions [5] with the product are as intended. The designers are outsiders who are not familiar with the culture of the insiders – the intended users – who in turn are seen as members of one or more cultural groups.

In summary, the aim of the research is:
To help designers who are engaged in a project in which they are unfamiliar with the culture of their intended users.

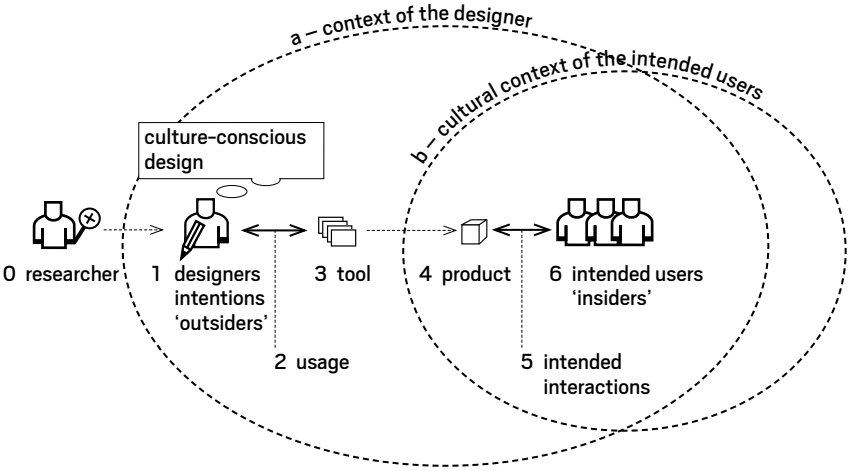


Figure 1.12 The focus of the researcher [0] is on the context of the designer [a] and the cultural context of the intended users [b], and characterised by six components: the designer [1] (intended user of the tool); the usage of the tool [2]; the tool [3] to facilitate culture-conscious design; the product [4]; the intended interactions with the product [5]; and the intended users [6] as a cultural group

1.2.2 Boundaries of the study's context

For a common understanding of the study's context, the term 'designer' and 'designing' are defined below. The designer is the intended user of the results of this study, and therefore needs to be introduced.

The designer defined

The term 'designer' is used in various disciplines (e.g. mechanical engineering, fashion, graphic design, and others). Also within the discipline of product design, designers can possess different sets of knowledge and skills. To enable a common understanding of the user for whom the tool will be developed, a characterisation of the designer is made in order to understand the context in which knowledge is generated, and to delineate the group of intended users. The designers in the

cases studied (in Chapter 3) and in the experiments (in Chapter 4) are those as defined here.

Integration of various, often contradictory, design wishes and requirements
The designer is an industrial design engineer, educated and trained to design products and services[3] for consumers and professionals. On the basis of a client's brief, the designer is schooled to consider the briefing carefully and to develop a design vision or direction that will steer the design process. The designer needs to deal with possibilities and restrictions related to various fields of expertise; these include, among others, production, ease of use, lifestyle, aesthetic experience, costs, sales, and the like, and are summarised in fields of expertise related to business, people, and technology. The focus in this thesis is on people (see Figure 1.13). The designer needs to deal with various, often contradictory, wishes and requirements in order to come up with integrated solutions. Within a design project, culture is just one of the various aspects the designer needs to take into account. This means that the culture of intended users will forms only a small part of a larger whole, implying that the designer's attention to it will be limited.

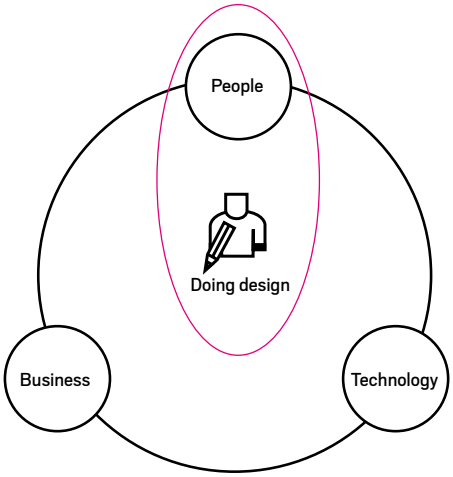


Figure 1.13 The designer defined: handling different areas of expertise

Broad understanding of related disciplines
It is impossible to have an in-depth understanding of every field mentioned above; hence, the designer's profile can be characterised as T-shaped. He or she has a broad understanding of and skills related to various fields of expertise

[3] The term 'product' as used in this thesis also refers to services and combinations of products and services.

(Kelly, 2005). In addition, the designer has a deeper knowledge regarding a specific expertise: for example, culture.

A systematic way of working
The designer has a comprehensive repertoire of design methods and tools that support the design process in three ways: to realise the goal, to organise the project, and to justify the activities (van Boeijen et. al., 2013, p.13). A method or tool that supports the designer in constructing a concept in a culture-conscious manner could fit well into this repertoire.

Time-conscious and user-centred design
The designer must develop an understanding of, a meaning for, and a concept regarding the past in order to comprehend the meaning of things in the present, and an understanding of the present in order to comprehend the values of existing things in order to appreciate needs and values pertaining to the future (see Figure 1.14).

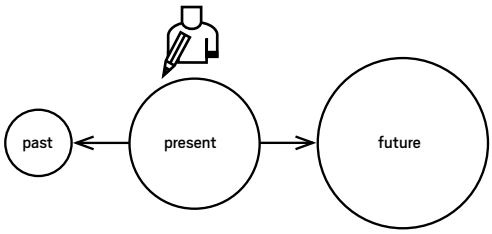


Figure 1.14 The designer defined: understanding past and present with a view to shaping the future

The starting point for this thesis is that the designer's perspective is user-centred, intending that the designer is concerned primarily with the creation of values as regards product users.

The activity designing defined
To show that the envisioned design activities occur in a business context, the product innovation model of Roozenburg and Eekels (1998) is used to indicate where in the product innovation process designing takes place. The main focus of the study at hand is on the first phases, 'Product Planning' and 'Strict Development', and is comparable with the Design Council (2005) phases 'Discover', 'Define', and 'Design'. Because of the user-centred focus, these phases relate strongly to the 'Use phase' in this model (see Figure 1.15). In the 'Use phase', focus is on the cultural context.

If we zoom into the model's 'Product Planning' phase, we see that the only activities of interest are those built on an understanding of the culture of intended

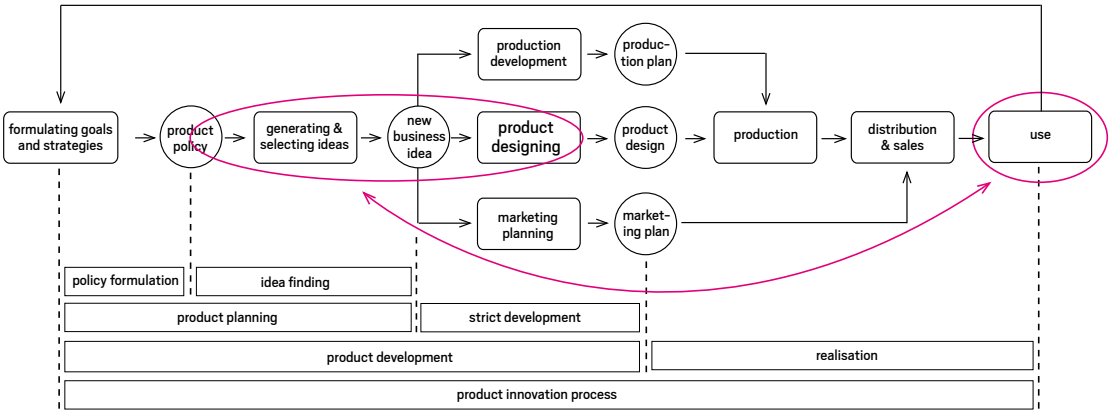


Figure 1.15 Focus of the research, indicated in the product innovation process model of Roozenburg and Eekels (1995)

users. To know the relevance of this activity, it is also examined as to what designers do with cultural insights when they are creating concepts. This is in the 'Strict Development' phase. Here, the position is taken that design research (i.e. done by the designer to develop a design direction and to determine the design conditions) and conceptualisation are linked to each other, and are executed by the same person or by several persons in a design team, and are not divided among different parties such as happens in large companies where user research (e.g. ethnographic research) can be outsourced to anthropologists. It is known from an earlier study (Sleeswijk Visser, 2009) that the recording and transferring of insights concerning users is difficult, probably because outcomes are diverse and partly tacit for the designer. The designers' efforts to understand the intended users' cultural backgrounds will contribute directly to the development of a design vision, and consequently to the conceptualisation of products. It should be noted that this study does not incorporate other activities involving a design project in which designers encounter cultural differences.

1.2.3 Research questions and approach

As stated earlier, the central question is:

How can we help designers who are engaged in a project in which they are unfamiliar with the culture of their intended users?

The research questions are:

- What do designers need in a project in which they are unfamiliar with the culture of their intended users?
- What are cultural barriers they encounter and what opportunities are there to support them?

There are many perspectives on the phenomenon of culture, depending on the discipline and related goals and concerns, as well as pertaining to the reason for, the purpose of, or the interest in the aspect of culture that needs to be studied. Therefore, the notion of culture should be framed within the context of a design project. For the development of a framework, knowledge emanating from both the existing literature (theory) and the design practice (empirical reality) will be used. Answers from the literature will be comprised of data relating to the development of a cultural framework (see Chapter 2) that serves as a kind of lens for the researcher to examine the design practice (see Chapter 3). Insights from the design practice will be material for the purpose of finely adjusting this lens (see Chapter 4) and for developing tool-related guidelines (see Chapter 5) that support designers in learning to create in a culture-conscious manner. This move from theory to empirical reality (practice of designing and innovation) is an iterative process, which means that the research activities transition repeatedly, using the output from one iteration as input for the next, and the empirical reality 'feeds' the development of the theory.
In this research, the iterations feed our understanding of how culture could be taken into account in the process of designing. This understanding forms the basis of the framework for culture-conscious design, and again serves as a starting point for development of the envisioned tool.

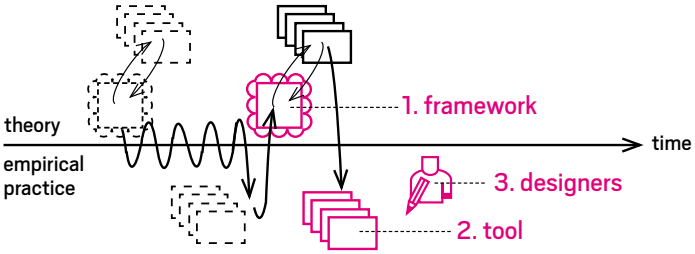


Figure 1.16 Repeated transitions from theory to empirical reality, and developing in parallel a framework and tool to assist designers to develop a culture-conscious approach

Development of the design tool is an activity that runs parallel with construction of the framework (see Figure 1.16), and it serves two goals. The first is to help develop the theoretical framework related to cultural-conscious design. The limitations of a tool assist in determining the essence of and relevance for the design practice. They also help the researcher to consolidate insights from the literature and studied cases. The tool's second aim is to help designers work in a culture-conscious manner. The tool is not only an end result in itself to be used in practice, but is at the same time a means to conduct the research and to develop the theoretical framework. The framework and the tool both contribute to culture-conscious design. As illustrated in Figure 1.16, each chapter begins with this rationale.

Research through design

The approach chosen for this study fits within the theory of Design-Inclusive Research (Horváth, 2007, see Figure 1.17), in which design actions form a necessary component of the development of theory. Design and research are combined in the process of generating new insights and artefacts, and a special form within this approach is 'research through design' (Archer, 1995; Zimmerman et al., 2010, see Figure 1.17), in which designing is an integral part of the research process carried out by the same person (Stappers, 2007). Within the context of this thesis, designing the tool is an integral aspect that is essential for the generation of knowledge.

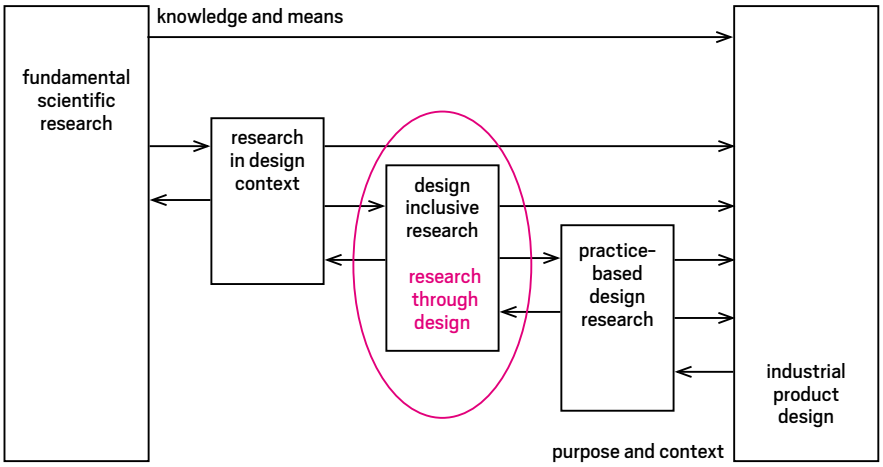


Figure 1.17 Design-Inclusive Research positioned in relation to other methods (adapted from Horváth, 2007 and Stappers, 2007)

The phases in this research show resemblance with the three distinct stages in design-inclusive research (Horváth, 2007): (1) explorative research actions (analysis), (2) creative design actions (synthesis), and (3) confirmative research actions (simulation and evaluation).

The development of the design tool, as presented in the following chapters, is explained in Figure 1.18 on the basis of research questions, and answers that are input for the tool regarding form, content and usage of the tool.

The empirical data from design practice (empirical reality) is qualitative, and involves a wide range of studied cases. These are projects carried out in the context of design education, conducted mainly in a context for real clients and real intended users. See Chapter 3 for a detailed description of the projects, research questions, approach, and results.

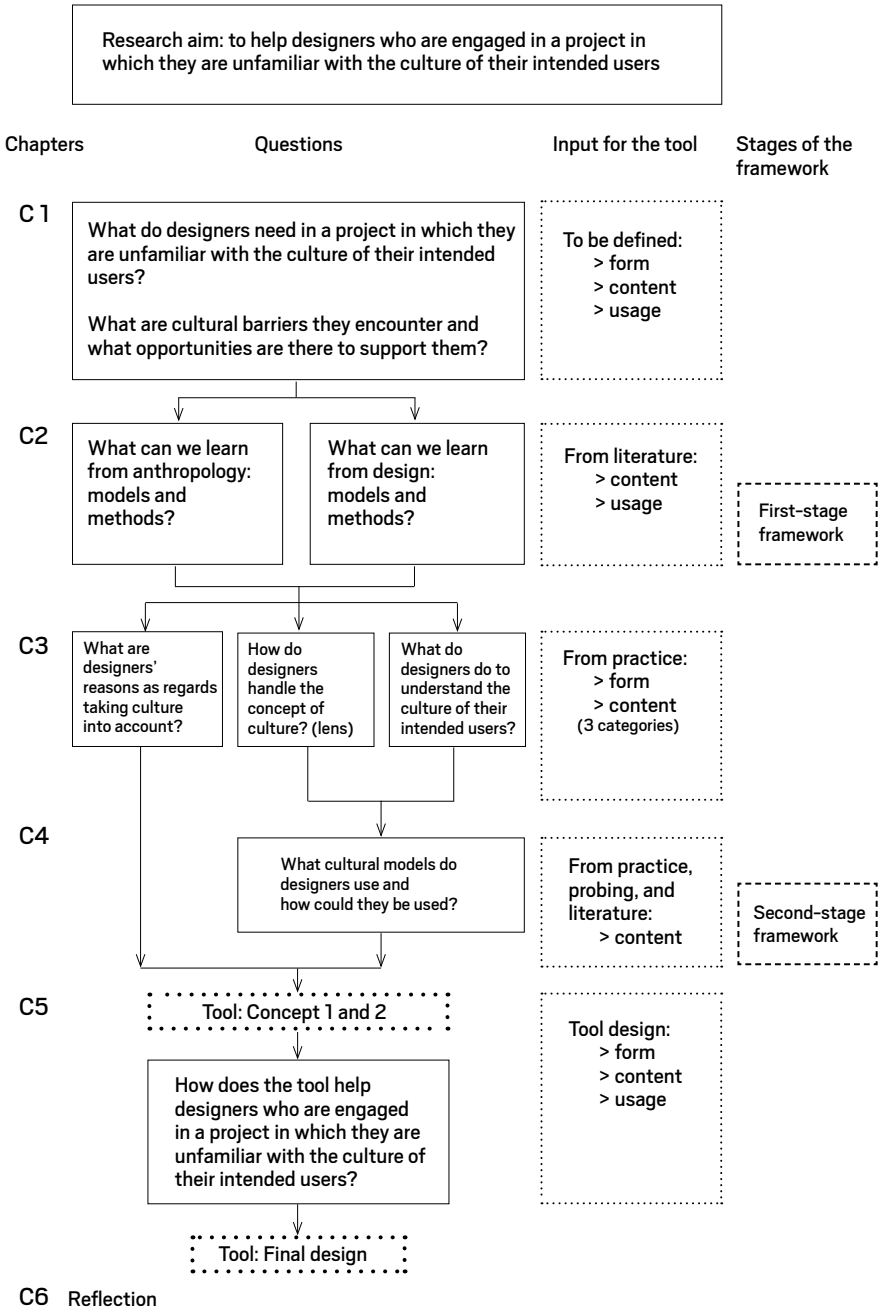


Figure 1.18 Overview of the design tool development process: research questions, input for the tool and the two stages of the framework

1.2.4 Researcher's role

In the course of this research, I had to assume several linked roles, each of which had specific – sometimes conflicting – demands. For clarification, the following diagram has been created. Figure 1.19 shows six roles that can be distinguished in the context of this study (based on Stappers and Hoffman, 2009), with each role serving another goal with associated activities.

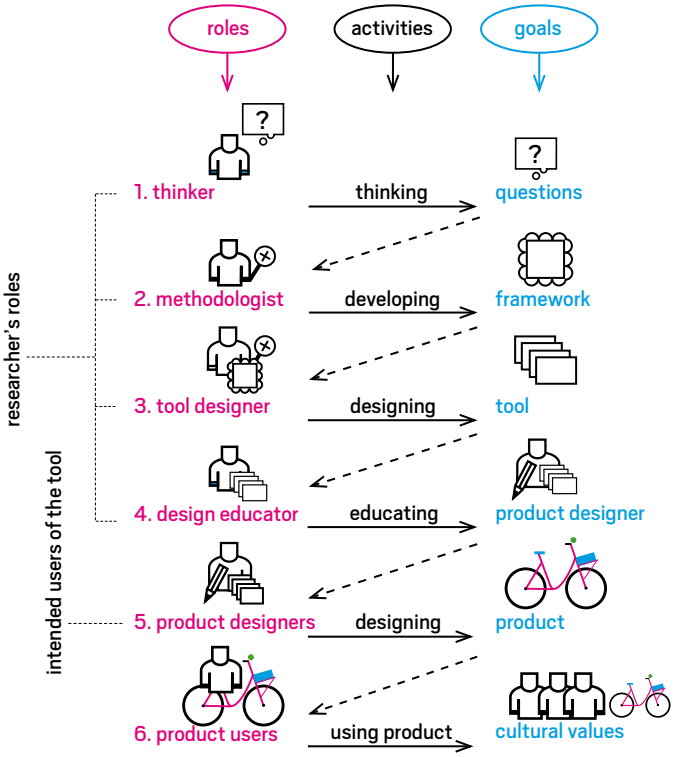


Figure 1.19 Multiple roles and related activities and goals (based on Stappers and Hoffman, 2009)

In the figure – and reading from top to bottom – I can be seen in the first four roles: (1) the thinker, who generates questions to be answered, (2) the methodologist, who develops an approach to find answers, and who develops a framework that serves as a lens to examine culture, and (3) the tool designer, who uses the framework and other insights from research to design a tool that, via (4) the design educator, can be used by product designers. For example in my role as educator I will act as an insider closely involved in some of the cases (presented in Chapter 3, see Section 3.1.2). Since I am educated and trained as a designer, have worked in the practice of design, and am also a product user, I am closely connected with the remaining two roles: namely, (5) the product designer, who

needs to understand the cultural context of the intended users, and (6) the product user, who will ultimately apply the product in a cultural context. My personal experiences with the latter two help me to understand the intended users of the tool development here. Each role will evoke other questions and methods to find answers (Sleeswijk Visser, 2005, pp. 71-72).

1.2.5 Expected results

The results of this work comprise a theoretical framework, describing a meaningful way for designers to look at culture, as well as a tool that helps them in terms of culture-conscious design. The main aspects for the development of the tool are divided into form, content and usage. Figure 1.18 shows that the main focus is on the development of the content, needed to help designers with a culture-conscious approach to design. Since the research for this thesis was conducted in an educational environment, and many studied cases are from student design projects, the study concludes in Chapter 6 with a reflection on design education, including recommendations for teaching culture-conscious design.

The next chapter will present findings from existing theory. The phenomenon of culture will be studied from the perspective of the disciplines of cultural anthropology and design, resulting in a first-stage framework that will be used to examine culture in the design practice.

C2 What is to be found in theory?

Models and theory
from the disciplines of cultural
anthropology and design

The previous chapter presents examples that illustrate how cultural aspects in the design practice have been underestimated or overlooked, leading to mismatches between products and users' perceptions. In brief, the central research questions are: *What do designers need in a project in which they are unfamiliar with the culture of their intended users? What are cultural barriers they encounter and what opportunities are there to support them?*
As discussed in Chapter 1, key elements for the research consist of a tool, the designers, their products, and their intended users, who are viewed as members of distinct cultural groups.
Research activities described in this chapter are shown in Figure 2.1.

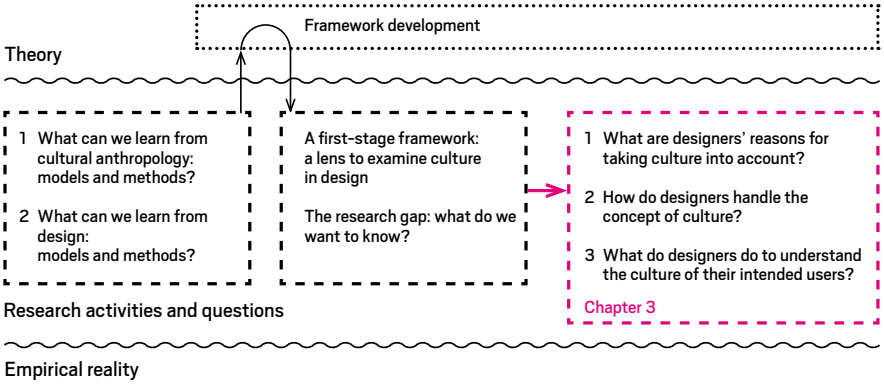


Figure 2.1 Overview of research activities presented in this chapter

We first need a common definition of culture. Culture is a complex and multi-layered phenomenon that has been studied in various disciplines and from diverse perspectives. In this chapter, culture will be framed within the context of design, and it is presented initially as a study of existing models from the discipline of cultural anthropology. State-of-the-art literature regarding models and methods available to designers for the study of culture will then be presented from the discipline of design (see Figure 2.2).

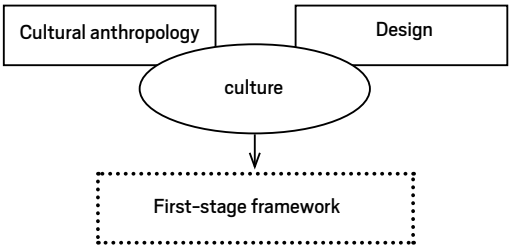


Figure 2.2 Insights from two disciplines leading to a first-stage framework

Insights from both literature studies will be used to develop a first-stage framework. The literature studies will also identify a gap in the body of knowledge related to culture, leading to questions to be answered in this thesis.

2.1 Cultural anthropology – Existing models and methods

This section presents an overview of various models and concepts that are offered in the literature, and that might help in understanding the concept of culture as we chose to apply in design. Since many perspectives exist on the phenomenon of culture, the section starts with a selection of and justification for the chosen perspective and a definition of culture. Findings are based on the literature, mainly from anthropology. This discipline is evolving along with design to become design-anthropology (Gunn et al., 2013, Eds.). Anthropology brings three elements to the design discipline: theory and cultural interpretation (Geertz, 1973); systematically investigation; and sensitivity to the value orientations of various groups affected by design projects (Otto and Smith, 2013).

2.1.1 Culture defined

How can culture be defined in a useful way for designers? The literature on culture is abundant, and has been published in diverse fields.

Culture approached differently in various disciplines

All disciplines that study culture can be characterised as having a holistic approach, as striving to study the 'big picture' (Hellemans, 2014), and as studying the total collective representations associated with a particular society. They also have this holistic approach in common with designers – as defined in this thesis – who strive to see the bigger picture, predicting the impact of their designs – for example, by life-cycle analysis – and integrating the parts into a whole.

However, many disciplines studying culture are geared towards understanding and explaining existing cultures on the basis of both the past and the present, whereas our designers are basically oriented towards the present and the future, and are keen to change existing situations. As the design historian de Rijk states: *'The discourse of design – and product design in particular – is hardly based on history. This is mainly because design should be future oriented, a notion that is heavily at odds with the development of a history that can be actively utilized'* (de Rijk, 2014, p.11). Designers, and the discourse about design, are heavily future oriented: '*As creators of models, prototypes and propositions, designers occupy a dialectical space between the world that is and the world that could be. Informed by the past and the present, their activity is oriented towards the future'* (Margolin, 2007, p.4). Anthropology is also less oriented towards the future, or at least lacks the tools that help designers. In a comparison of design and anthropology, Otto and Smith

(2013) state: *'Although anthropology has an interest in social change and people's imaginations of the future, as a discipline it lacks tools and practices to actively engage and collaborate in people's formation of their futures* (p.3)'.
This applies as well to scientists studying the material culture – such as Paul du Gay (du Gay et al., 1997), Judy Attfield (Attfield, 2000), David Miller (Miller, 1998) and Ketjil Fallan (Fallan, 2010) – or to scientists studying socio-cultural behaviour – such as Clifford Geertz (Geertz, 1973) and Edward Hall (Hall, 1976). They are driven more by understanding and explaining what exists, based on what can be known from the past and the present. The work of organisation theorists such as Frans Trompenaars (Trompenaars and Hampden-Turner, 1998) focuses more on problem solving in daily practices in organizations. Figure 2.3 gives an overview of the orientation towards time for different disciplines, based on the researcher's interpretation.

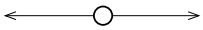
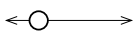
Discipline	Possible intention or focus	Main orientation past – present – future
Design history e.g. Paul du Gay, Ketjil Fallan, Victor Margolin, Edward Miller	e.g. understanding the cultural meaning of artefacts in a specific time frame and context	
Anthropology e.g. Clifford Geertz, Edward Hall, Mary Douglas	e.g. understanding the meaning of people's daily practices in a specific context	
Organisation, communication, and management e.g. Geert Hofstede, Stella Ting-Toomey, Frans Trompenaars	e.g. understanding cultural differences to achieve effective cooperation within a business context	
Phylosofy of technology e.g. Bruno Latour, Petran Kockelkoren, Peter Paul Verbeek	e.g. understanding the influence oftechnology on cultures and societies	
Design	e.g. understanding the culture of intended users to create new products	

Figure 2.3 Disciplines approaching culture differently: divergent intentions and focus, and a different orientation with respect to time

This means that the literature on culture might fail to deliver the appropriate messages to designers, and it might therefore also explain why designers do not easily gain a toehold in all these cultural theories. On the basis of experiences in design education, it is known that design students have difficulties in applying insights from, for example, design history to a design project (Howell and

Christensen, 2013). Moreover, the aspect of designers' attention to the past is not well served. In their desire to create something new, designers overlook valuable elements that can be learned from the cultural history.
However, the perspective of the design historian as well as that of other disciplines engaged in studying culture does not match the perspective and aims of designers. Therefore, designers need to have some sort of tooling to support them in examining culture in such a way that it fits the future-oriented perspective of the design discipline, incorporating what can be learned from the past and the present. Theory and models should be in tune with designers' mind-sets.
An example of a model to study the cultural meaning of products is the Circuit of Culture (du Gay et al., 1997). The strength of the model is that it is comprehensive, and it shows the dynamics and fluency of culture. It describes five processes that influence the cultural meaning of products, helping in the study of semiotic questions about meaning rather than of normative questions concerning what is good and bad. A weakness of the model is that it is not guided by a theory on how to apply it in a cultural study. Moreover, it does not provide a lens to examine what is typically cultural – to explore what distinguishes one culture from another and, consequently, what might be overlooked.

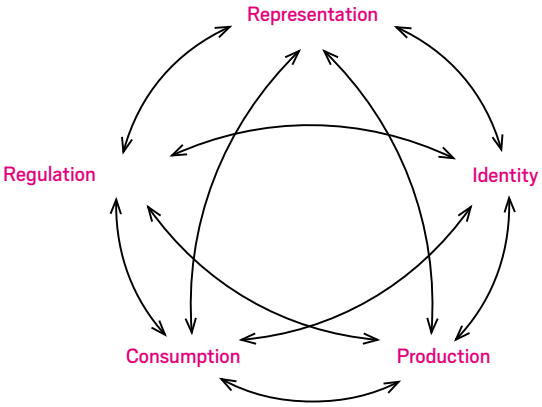


Figure 2.4 Circuit of Culture (du Gay et al., 1998)

The types of barriers described in Chapter 1 seem – in the first instance – able to be studied from an anthropological perspective; the examples show that the different cultural contexts require other solutions. Culture here is seen as relative to some particular frame of reference, to another culture. This means that the cultural backgrounds of the designers are as important as the cultures of their intended users. In addition, the cultural background of the researcher relates to these cultures.
The lens that is instrumental in examining possible differences between groups is Geert Hofstede's cultural dimensions model and his onion model (Hofstede, 2005).

The anthropological focus on cultural values and related practices seems to be appropriate in terms of how we might examine the cultural barriers. A weakness of the model is that it does not show the dynamic reality, and it does not cover all cultural processes that might be of interest to designers. Figure 2.5 illustrates an overview of the strengths and weaknesses of both models for the purpose of this research.

	Circuit of Culture	Onion model and dimensions
Strengths	• comprehensive: processes that influence each other • showing complexity and dynamics of the cultural meaning of products	• lens to look at what may differ • focuss on values and daily practices
Weaknesses	• not a lens to look at possible cultural differences based on culture specific values	• not showing the complete dynamics of cultural meaning of products

Figure 2.5 For the purpose of this research, strengths and weaknesses of both models

Despite the limitation, this anthropological framework has been chosen as the point of departure, as it involves the theory that matches the types of problems discussed in Chapter 1, and at first glance its complexity is limited. In the following sections, the framework will be further explained. Some models have also been selected because of their applicability in practice. The limitations experienced will be discussed in Chapter 6.

Definition

Krober and Kluckhohn (1954) had already listed 164 definitions for culture found in the anthropology literature. A common starting point in these definitions used in this research is that people are examined as group members that need to belong to one or more groups, and that, in order to deal with each other, need to a certain extent a common ground, a shared understanding of their shared environment. The anthropologist Geertz (1973) looked at culture as a set of control mechanisms (plans, recipes, rules, and instructions) for regulating human behaviour. In line with this, the following definition of culture applies: *'…[the] collective programming of the mind that distinguishes the members of one group or category of people from the other'* (Hofstede, 2005, p.4). Another definition, meaningful in the context of design because it includes explicitly material culture, is the following: *'…[the] system of shared beliefs, values, customs, behaviours and artefacts that the members of a society use to cope with their world and with one another, and that are transmitted from generation*

to generation through learning' (Bates and Plog, 1976). In our definition a society consist of people that can be grouped in different ways, such as by nation, profession, and sports, see further in 'Boundaries: delineation of a cultural group' in Section 2.1.2.

Furthermore, the starting point is taken that culture is not something inherited but learned; similar to computers, our minds are partly programmed in a way that we are able to think, feel, and act in a collective way. Next to culture as a level on which to examine people's attitudes, Hofstede distinguishes two other levels of uniqueness in mental programming: 'personal characteristics' that can be either inherited or learned, and 'universal characteristics' that belong to human nature and are inherited only. In Figure 2.6, these distinctions are linked with a bicycle. This pyramid is an element of the first-stage framework (see Figure 2.22) that will be used as a lens to study cases.

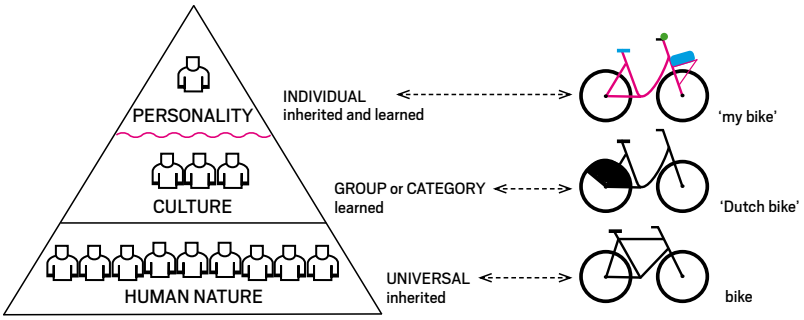


Figure 2.6 Three levels of uniqueness in mental programming (Hofstede, 1997), illustrated by means of a bicycle. The attention of the designer is drawn to different aspects of the design, depending on her/his lens. The border between personal and cultural is curved to indicate that they are difficult to separate

Below is an explanation of the three levels:

- On the universal level, the bicycle can be seen as an efficient way of using human energy for transport purposes. Universal design characteristics are applied when they are based mainly on characteristics relating to human physical capacities, and indeed many product innovations are based on these physical principles. The bicycle's configuration is based on people's physical capabilities, independent of the culture(s) to which people belong;
- On the group level, the bicycle can be seen as a product that represents specific values or an identity for a particular group. For example, the typical configuration of the frame and steering system of a bicycle has become a symbol for the Netherlands, and is known as the Dutch bike ('oma fiets', which means 'grandmother bike'), even though the design originates from the United Kingdom (Sardar, 2012, p. 19). Such a meaning is learned and not

inherited; the bicycle cannot be seen as Dutch if people do not know the history. A social value linked to this meaning could be the sense of belonging to a group. The cultural value could be that this specific bicycle represents a particular group that shares the same values. For example, bicycles in a context in which every group member uses them, irrespective of his or her social status, demonstrate that the notion of hierarchy is rated low;

- On the individual level, the bicycle can be seen as a product that matches the preference of single users. In theory, the individual and cultural levels are separated, but in practice these individual preferences are influenced by culture, since culture cannot be separated from the individual (de Mooij, 2004; Hellemans, 2014, p.88). The solid line therefore becomes a curved one, in order to represent this uncertain boundary.

The pyramid metaphor is meaningful for designers when they examine culture. However, culture in a design project is not the only point of interest; intended users are studied on each level, and thus are visualised as in Figure 2.7.

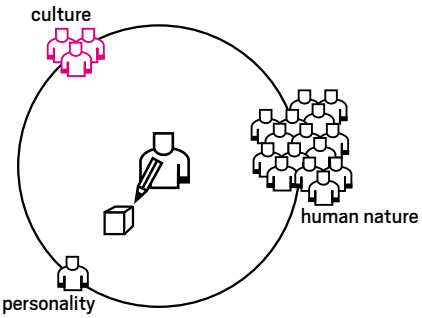


Figure 2.7 The designer needs to understand intended users on a personal and a cultural level, as well as in terms of human nature

These distinctions are useful, because they make designers aware of the need to understand the users of their designs on each of these levels. However, the situation is also complex, because in design practice the levels are intertwined. In Chapter 3, we will see how designers deal with these distinctions. The extent to which culture should be taken into account in design projects will be discussed in Chapter 6.

2.1.2 Culture manifested

Culture can be experienced by means of the activities of people who belong to distinct groups at a specific time and place. Four key distinctions have been selected from the literature that seem promising to frame culture in a way that is useful for our purpose: that is, to examine the culture of intended users within the context of a design project. The key distinctions are boundaries, layers, values, and stereotypes.

Boundaries – Delineation of a cultural group

Firstly, it is important to frame culture as a manifestation that can be observed in different groups and on diverse levels. The boundaries can be determined by the mental programmes that people share, based for example on geographical location (nations, regions, cities, and the like), economical situation (social classes, incomes, and so on), ascription (gender, generations), or achieved identity (profession, lifestyles, sports, and so on). With the growing possibilities of travelling from one place to another, and the exposure to different cultures via social media, the number of cultural groups any individual is exposed to increases, and new groups are created.

Cultural identity can be perceived on different levels: that of an individual or of a specific group. De Mooij (2004) distinguishes *identity* and *image*, with identity being the idea one has about oneself, while image is how others see us. *Achieved* identity is determined from what one does, and *ascribed* identity derives from fixed expectations based on non-chosen characteristics such as gender and age. According to de Mooij, the ascribed identity, defined by this fixed characteristic, is stronger in cultures with a high hierarchy, in which social positions are clearly defined, than in low-hierarchy cultures. Products contribute greatly to *achieved* identities. Especially in societies where hierarchy is low and positions are not clearly defined, products have a mediating role in the development of these *achieved* identities. The previously mentioned Dutch bike contributes to the achieved identity of a national culture. A differentiation with respect to the achieved identity of a nation is the assessment format (*beoordelingsformat*, Pleij, 2010). This format is based on practices from the past that are deeply rooted in language and that people use to assess the identity of a group. It serves a human need to categorise information to reduce complexity. The term assessment format is useful in the context of design, because it implies the subjectivity of identities; they serve a social need but are not based on one truth. Designers could think of affirming or changing identities by means of their designs. In Chapter 3 we will see how designers use these forms of identities.

For the delineation of a cultural group, the focus here is mainly on cultures that have been slow to change. Therefore, the concept of culture is applied mainly to cultures distinguished by nation, region, and profession. The advantage is that cultures on these levels are relatively stable and, as will be discussed later in Section 2.1.3, models for this level are available from anthropology, and can be used to typify culture. Thus, rapidly changing lifestyles, as can be found in fashion, were not a point of interest in the present research. Therefore, as we will see in Chapter 3, the selection of cases studied for this thesis was based mainly on expected cultural differences on a national and regional level. Most of the selected design projects are BoP projects. An advantage is that people in a BoP context often live in cultures with which our designers are not familiar – the launching point for the goal of this research – and this extreme contrast makes it easier to distinguish cultural aspects. Furthermore, intended users living in a BoP

context move less often between different cultural groups than do people living in a ToP context. The latter are more exposed to various groups, and are influenced by economical and technological changes.

Layers – Cultural values and practices

Cultures manifest in different ways. A frequently used metaphor is that of the iceberg, as it demonstrates that a part of the culture can be easily observed, while the rest remains hidden (see Figure 2.8).

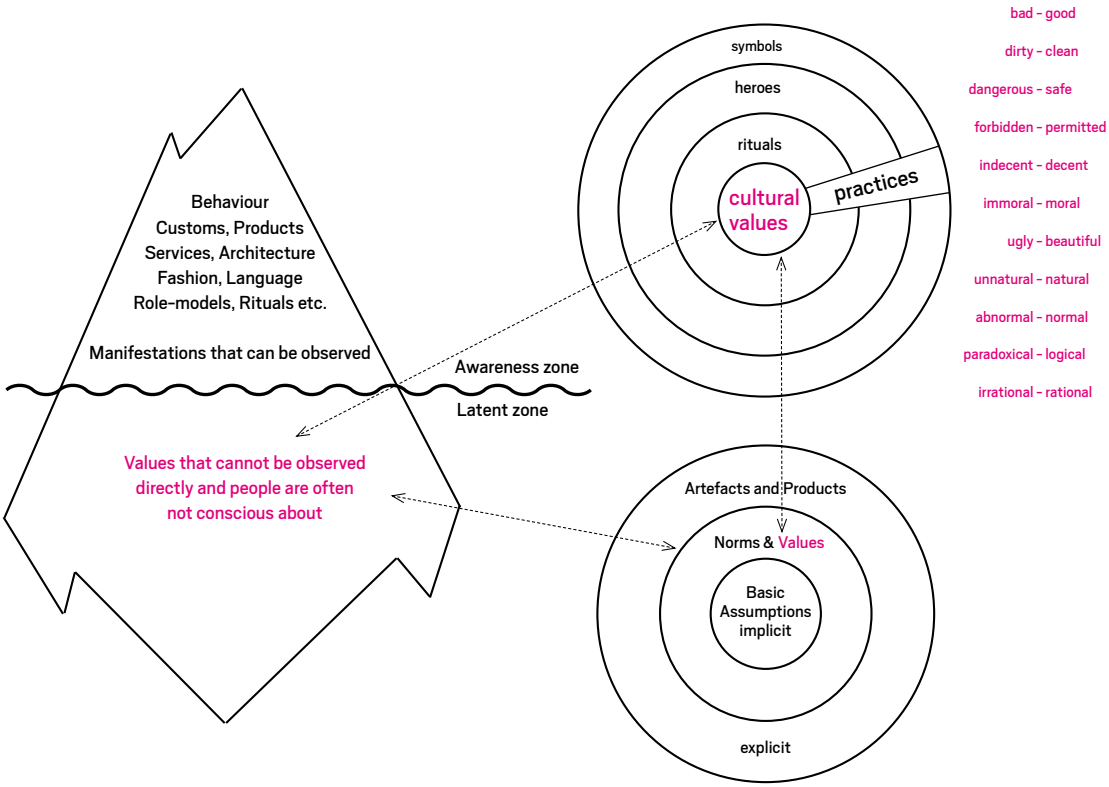


Figure 2.8 The iceberg model (left); Hofstede's onion model (upper-right) (1997, p.7) and Trompenaars and Hampden-Turner's onion model (lower-right) (1998, p.22)

A similar way of showing that values are not on the surface is through the metaphor of an onion, proposed by both Hofstede (2005, p.7) (see Figure 2.6, upper-right) and Trompenaars (1998) (see Figure 2.8, lower-right). Hofstede's metaphor represents cultural values as the core of a culture, hidden in the centre and surrounded by three layers: rituals, heroes, and symbols (see Figure 2.8, upper-right). The outer-layer 'symbols' comprise words, gestures, images, and

objects or artefacts, such as consumer products, services, art, and dialect, but also fashion and behaviour. For designers, this is the most important layer, and includes almost every aspect that a designer will elaborate on. Values are also manifested in the 'heroes' of a specific cultural group. These are role models, alive or dead (e.g. Nelson Mandela)[4] and real or fiction (e.g. Harry Potter and Voldemort)[4]. A hero in the design practice could be an important local person such as a pop star or a village chief. Hofstede presents 'rituals' as the layer closest to values. Rituals are collective activities, not having the purpose of fulfilling a usage function with a utilitarian value but of functioning as a social interest for the group. For example, a wedding ceremony might be seen as a ritual designed to make a public commitment regarding the nature of a relationship. Similar joint rituals, for example, involve saying a prayer of thanksgiving before a meal, or finishing the day by reading children a bedtime story. Typical for a ritual is the role of time in the course of events, a factor seldom taken explicitly into consideration by designers. Indeed, the representation of values and practices in the onion model would seem to be useful. The possibilities of using this model will be discussed in Chapter 4.

Cultural values

The term 'value' is used in different ways. According to Hofstede, a cultural value is a collective tendency to prefer a certain course of events above another, expressed by qualifications such as good and bad, dirty and clean, ugly and beautiful. For example, in the Netherlands it is perceived as good to ask a lecturer questions in public, as it means that you are interested and eager to learn. In certain other cultures, asking a lecturer questions is not appreciated, because it implies that the lecturer was not clear or might be incapable of answering the question, which is perceived as embarrassing for the group. Cultural values are difficult to determine from individuals, because they are often not conscious of them. For this reason, the iceberg metaphor is applied. Trompenaars and Hampden-Turner distinguish norms and values as well as – one-step deeper – basic assumptions (see Figure 2.8). These are values of which people are not aware, and when someone's hidden assumptions are being questioned, they evoke confusion and irritation. The authors define norms as a group's mutual sense of right and wrong. Norms give us a feeling about how we *should* behave. Values, on the other hand, determine the definition of 'good and bad', and are therefore closely related to the *ideals* shared by a group (Trompenaars and Hampden-Turner, 1998 p.21-22). These ideals are in line with what Hofstede calls desires or preferences. The distinction between basic assumptions, norms, and values is difficult to recall with product examples, and will therefore not be used for the framework. The psychologist Schwartz also studied value preferences on an individual level

[4] For clarity for readers from different countries, the selected examples are known worldwide.

(Schwartz, 1994a, 1994b). In one of his more recent publications he emphasises five main features that relate to basic values: '*(1) Values are beliefs. But they are beliefs tied inextricably to emotion, not objective, cold ideas. (2) Values are a motivational construct. They refer to the desirable goals people strive to attain. (3) Values transcend specific actions and situations. They are abstract goals. The abstract nature of values distinguishes them from concepts like norms and attitudes, which usually refer to specific actions, objects, or situations. (4) Values guide the selection or evaluation of actions, policies, people, and events. (5) Values are ordered by importance relative to one another*' (Schwartz, 2006, p.0). These features are useful distinctions in addition to Hofstede's definition of values. In Section 2.3.2, we will discuss the different kinds of values distinguished in the design discipline, and at the end of this chapter a conclusion will be made as to the definition of values that will be used in the framework.

Stereotypes and archetypes

In discussions about cultural differences, BoP project design students reported feeling uncertain about the extent to which their stereotypes about intended users hold. A stereotype is a simplified and/or standardised conception or image with a specific meaning. A stereotype can be a conventional and oversimplified conception, opinion, or image, based on the assumption that there are attributes that members of the group hold in common (McGarty et al., 2002). They are typically generalisations that cause mismatches between a design and users if the conception, opinion, or image does not match the experienced reality of the individual person. People categorise in many ways regarding sex, race, religion, ethnicity, age, nationality, and the like. And because – like marketers – designers design products and services for groups of people, and not for the individual, they need to draw on stereotypes to a certain degree. Designers even contribute to the creation of stereotypes or archetypes. The word archetype has a more neutral connotation, since an archetype can be defined as a generic, idealised model of a person, object, or concept from which similar instances are derived, copied, patterned, or emulated (archetype, n.d.). In psychology, an archetype is a model of a person, personality, or behaviour. In design, an archetype is a model of a product, representing the main characteristics of a product class. Archetypes will change in the course of time; young people, for instance, might not recognise the archetype of a telephone from the 1960s. And especially people living in poor areas, intended users in our BoP projects, who are exposed to fewer products than people living in a ToP context, might never have seen these archetypical products. It is therefore obvious that if designers want to understand the culture of their intended users, they also need to understand how to deal with stereotypes. In addition, designers must be aware of those archetypes with which their intended users are familiar. In Chapter 3, in the cases studied, we will see how stereotyping causes uncertainty and biases among design students, and how in some instances local archetypes are used to bridge the cultural gap.

2.1.3 Cultural dimensions – Models to typify culture

Many, if not most, cultural anthropologists, and especially ethnographic researchers, describe cultural practices as a set of manifestations in a particular situation, dependant on time and place. They describe a culture from the emic point of view. For designers, it could be useful to reason not only from this situational, existing context but also from more generic insights into the specific (as they do while engaging in reductive reasoning, as explained by Roozenburg and Eekels, 1995, p.58-59; see later in Figure 2.10). The aim of this research is to approach culture from the etic point of view, using external criteria to describe and compare the behaviour of different cultures. The literature shows that several models have been developed to typify cultures. Based on the measuring of individual values held by members of a specific group, it has been possible to make generic statements about these groups in comparison with other groups. These models are explained in the following section.

Several cultural anthropologists have developed dimensions along which cultural values can be measured. The main motivation to measure cultures originates from the desire to understand differences in the way groups of people interact with each other, and to predict how interactions evolve when people from different cultures encounter one another. The need to improve these interactions was in the first instance found in cross-cultural cooperation in multinational organisations; but due to rapid globalisation, however, the need has arisen in many other situations in which people from different cultural backgrounds come into contact. Hofstede (1998) developed a model that is well known and used worldwide. In the 1970s, he began with the development of a method to measure, describe, and compare cultural groups. This comparison is based on the relationship between members of a group and their shared values. He started his measurements in the context of international organisations, and on the basis of a questionnaire developed by the company; 40 national subsidiaries of the IBM Corporation identified four dimensions of national culture. The fifth and sixth dimensions are based on the work of Michael Minkov (2007) (see Table 2.1). What does this model mean for designers? These dimensions could be used basically for two activities in the design process: to analyse the cultural end-user group and to synthesise products. For each dimension, suggestions that might be relevant for designers are proposed in Table 2.1.

In Hofstede and Hofstede (2005) each dimension is described extensively with examples of cultural practices in different domains, such as education, work, and leisure. In addition, a CultureGPS tool (CultureGPS, 2013) has been developed to navigate intercultural differences. It is possible to compare 98 countries and three regions with each other or with one's personal profile. Trompenaars and Hampden-Turner (1998) and House et al. (2004) developed their own sets of cultural dimensions. These were based on Hofstede's work and were adjusted to their own insights from research. Schwarz's (1994) study resulted in a set of seven

Hofstede's (2005) and Minkov's (2007) dimensions defined	Expected relevance for designers; a few examples
1 – Power Distance (PDI) It expresses the degree to which less powerful members of a society accept and expect that power is distributed unequally. The fundamental issue here is how a society handles inequalities among people. People in societies exhibiting a large degree of power distance accept a hierarchical order in which everybody has a place, and that needs no further justification. In societies with a low power distance, people strive to equalise the distribution of power and demand justification for inequalities of power.	In a participatory session where intended users need to express themselves freely, it would be useful to select these users in such a way that they do not experience hierarchy. It could be relevant to study how products, and related interactions, support the power of a group and which products mediate in lowering the power.
2 – Individualism versus Collectivism (IDV) Individualism can be defined as a preference for a loosely knit social framework in which individuals are expected only to look after themselves and their immediate families. Collectivism represents a preference for a tightly knit framework in a society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty.	It could be relevant to consider to what extent the product is designed to share with group members. The example in Chapter 1 shows that a collective use of mobile phones led to a new product idea (Figure 1.5).
3 – Masculinity versus Femininity (MAS) The masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness, and material reward for success. Society at large is more competitive. Its opposite, femininity, stands for a preference for cooperation, modesty, caring for the weak, and quality of life. Society at large is more consensus oriented.	This dimension could motivate designers who are questioning whether their product should contribute mainly to the achievements of individual people and with distinct roles for women and men, or whether it should evoke caring interactions between people.
4 – Uncertainty Avoidance (UAI) The uncertainty avoidance dimension expresses the degree to which members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behaviour, and are intolerant of unorthodox behaviour and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles.	If intended users in a participatory session tend to avoid uncertainties, clear rules and examples could help them to feel comfortable enough to express themselves. For a product, it could be questioned as to what extent product-user interaction should be unambiguous or not.

5 – Long-term Orientation (LTO) The long-term orientation dimension can be interpreted as dealing with society's search for virtue. Societies with a short-term orientation generally have a strong concern regarding establishing absolute Truth. They are normative in their thinking. They exhibit great respect for traditions, a relatively small propensity to save for the future, and a focus on achieving quick results. In societies with a long-term orientation, people believe that truth depends very much on situation, context, and time. They show an ability to adapt traditions to changed conditions, a strong propensity to save and invest, to be thrifty, and to persevere in achieving results.	This dimension could, for instance, be used by designers to question to what extent their product refers to the past – e.g. by using traditional decorations – or to the future – e.g. by introducing a totally new type of product-user interaction.
6 – Indulgence versus Restraint (IND) The indulgence dimension involves a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint stands for a society that suppresses gratification of needs and regulates it by means of strict social norms.	It might be easier to introduce a participatory session to a group of intended users who score high on indulgence than to a group of people who score low on this dimension. Products could amplify this value by their expressive forms and colours.

Table 2.1 Overview of Hofstede's and Minkov's cultural dimensions (Hofstede, 2014) and examples of the possible relevance for the design process

value types: conservatism, intellectual autonomy, effective autonomy, hierarch, mastery, egalitarian commitment, and harmony. They are not independent, and are therefore not seen as dimensions (de Mooij, 2004, p.39).
In the first instance, Hofstede's dimensions will be used for three reasons: credibility, familiarity, and availability. Firstly, the studies have been validated thoroughly and cited often, and are still used for research as well as for cross-cultural training. Therefore, it is a credible model to apply in the design context. Secondly, the master design students in the cases studied (Chapter 3) and in the experiments (Chapter 4) studied Hofstede's theory in their master course Internationalisation. These students are familiar with the model and theory, and some apply it in design projects. Thirdly, theory and data are accessible. In Chapter 4, we will see the model's possibilities as well as its limitations for application in a design context.

2.1.4 Other cultural theories

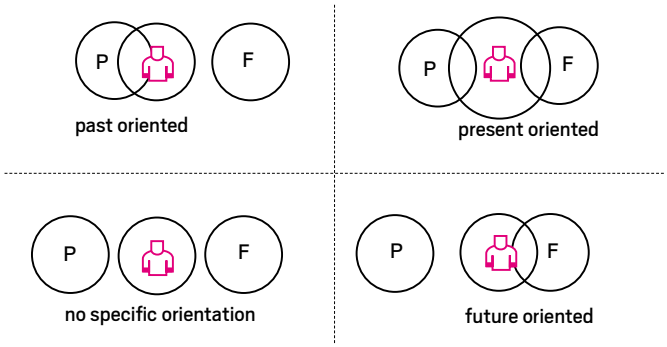
In addition to cultural dimensions, there are three other generic theories that might be valuable for development of the framework. The models involving the diverse ways that cultures deal with 'time', 'space', and 'communication' discussed

below are supplementary to the cultural dimensions, although they also show some overlap.

Time – Different orientations and practices

The literature reveals that the way people perceive and deal with time differs between cultures (Hall, 1976; Trompenaars, 1998; Levine, 2006; Hofstede, 2005). Hall distinguishes monochronic and polychronic cultures, often referred to as M-time and P-time. In monochronic cultures, activities run sequentially in time; people are used to completing one thing before beginning another, and activities are planned and limited depending on the specific situation. In polychronic cultures, a number of activities are conducted in parallel, as people are used to doing more than one thing at a time, depending on the situation.

Time is also an important aspect because culture is connected with history and cannot be separated from the historical context. '*Culture includes what have 'worked' in the past'* (de Mooij, 2004, p.26). Therefore, a cultural study should always include some understanding of the past, otherwise designers run the risk of using symbols that have unintended connotations.



The Circle Test

'Think of the past, present and future as being in the shape of circles. Please, draw three circles on the space available, representing past, present and future. Arrange these circles in any way you want, in a manner that best shows how you feel about the different circles. When you have finished, label each circle to show which one is the past, which one the present and which one the future' (in Trompenaars and Hampden-Turner, 1998, p. 129).

Figure 2.9 The Circle Test (Cottle, 1967) to determine preferred orientation in time

Another time-related difference involves how cultures value time differently: their past, present, and future. One culture is more past oriented than others. For example, Trompenaars and Hampden-Turner (1998, p. 136) illustrate this

with an anecdote about Ethiopia. A Dutch manager was highly frustrated by his unsuccessful efforts to organise a Management of Change seminar with Ethiopian managers. He eventually found that he could capture everyone's enthusiastic support by creating a link with the history of Ethiopia's flourishing trade in the past. By making this connection, he was able to discuss challenges for the future. Cottle (1967) proposed the Circle Test in order to measure these preferred orientations towards time (see Figure 2.9).

What does this mean for designers? In designing for a past-oriented culture, they could cite from classic designs within this culture. In a future-oriented culture, intended users might be more open to a radical break from past forms. For now, the theory about time will be incorporated in the first-stage framework, through Hofstede's Long-Term Orientation dimension. In Chapter 4, we will return to the cultural significance of time.

Communication – Different ways to understand the message

The time it takes to speak in a voicemail differs between cultures. For instance, phone conversations in Japan take more time than in the United States of America, due to differences in how people are expected to communicate with each other. In Japan, it is considered important to take time for the introduction when starting a conversation, but less so in the United States of America (Honold, 2000). How can this difference be explained? Hall distinguishes *high context* and *low context* communication (Hall, 1976). According to Hall, high-context communication means that most of the information is either in the physical context or is initialised in the person, while very little is in the coded, explicit, transmitted part of the message. In comparison to the meaning of low-context communication, the information is vested in the explicit code. In other words, the terms high-context communication and low-context communication refer to how much speakers rely on things other than words to convey meaning. Hall states that in communication, individuals face many more sensory cues than they are able to process fully. In general, cultures that favour high-context communication will pay more attention to the surrounding context than to the literal meanings of words. Low-context cultures are more rule-oriented and task-centred, and need less time to convey the message. This explains why Americans, who are accustomed to low-context communication, indeed need less time to speak in a voicemail than do the Japanese, who come from a high-context culture. In high-context cultures, there are numerous rules or codes of etiquette about how you greet, how you begin and end a conversation, what you wear, the gifts you bring, the time of the conversation, and the objective of a meeting.

What does this mean for designers? People who are used to high-context communication may pay more attention to the social meaning that products communicate by way of their form and properties (including aspects such as colours, decorations/patterns, form details, and materials) than do people

from low-context cultures. However, low-context cultures are also often more individualistic, and in these, according to de Mooij (2004), the cultural meaning of products is also important, especially to support people's achieved identity. Another theory explains how language differences between Chinese and Americans lead to different categorisations of artefacts (Nisbett, 2003).
As with the notion of time and space, this communication theories will not be used explicitly for the first-stage framework. For now, through Hofstede's Long Term Orientation dimension about contextual truth this theory is covered.

There are possible pitfalls for the application of anthropological models in design. In her study of the use of refrigerators in Turkey and the USA, Botzepe (2007b) writes that Hall's model predicts the opposite of what happens in practice. With Turkey being a high-context culture, the model predicts handling multiple tasks at the same time. However, in a host-guest interaction, Turkish participants behaved as in a monochronic culture. *'Therefore, for design purpose, such static categorizations of cultural dimensions are obviously doomed to remain inadequate'* (Botzepe, 2007, p.521). Any model is an abstraction of a reality, and therefore should be applied carefully. Possibilities for the application of cultural models in design projects will be explored in Chapter 4.

2.2 Design – Existing models and methods

Now that we have a better grasp as to how culture is framed, we will see how an understanding of the culture of intended users is embedded in existing design methodology. What models and methods have been developed that help designers with culture-conscious design? Findings are based on the literature, publications, books, design curricula, and the author's 20 years of experience in design (see Section Curriculum Vitae).[5]

2.2.1 Models for dealing with culture in design

Reasoning model – The reasoning model (Roozenburg and Eekels, 1995, p.53-60) has been chosen as a key element in design methodology (see Figure 2.10). Figure 2.11 gives an example. This model represents how designers reason from the form (geometry) of a product, via properties and functions, to the needs and

[5] Literature in the research domain of Human Computer Interaction Design has not been a focus of study. Although in this domain the relevance of cultural differences for design is recognised, due to all manner of misunderstandings regarding metaphors used and other forms of communication (Siu-Tsin et al., 2005) as well as preferences for local industry styles (Snelders et al., 2011), it was decided to examine cultural values in relation to three-dimensional products, which were in accordance with the type of projects studied (presented in Chapter 3).

values and vice versa. The arrows indicate causal relations in analysing (deductive reasoning) from form to values. Synthesising (abductive reasoning) goes in the opposite direction, from value to form. This model is useful for the present research, because it helps indicate where and how cultural values link with aspects that designers need to consider. The focus here is on cultural values and on abductive reasoning.[6]

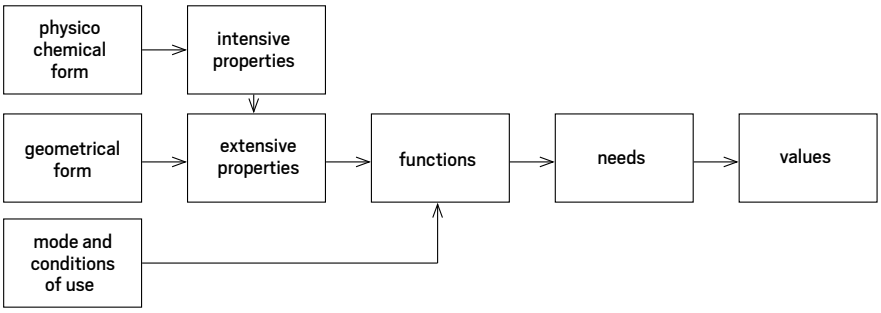
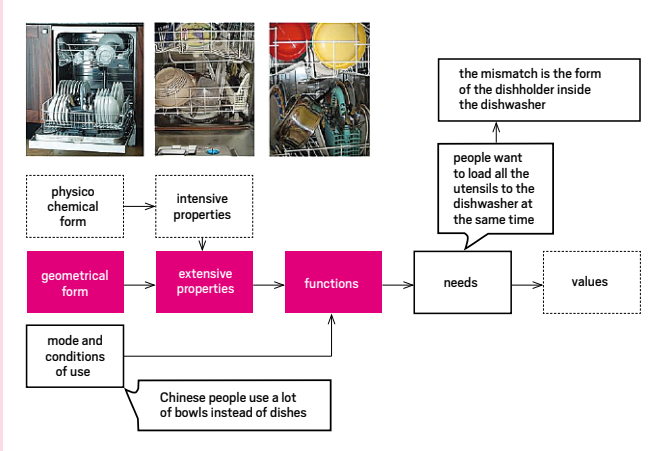


Figure 2.10 Reasoning model in design (Roozenburg and Eekels, 1995, p.58)



In a graduation project, design student Minwen Dong used the reasoning model to analyse cultural mismatches of products. In this example, the configuration of the rack inside a dishwashing machine does not meet the needs of Chinese users, who use many more bowls than plates. The final form does not meet the users' need.

Figure 2.11 Example of use of the reasoning model regarding a dishwasher

[6] Dorst (2007) explains the importance and benefits of abductive reasoning, and distinguishes two types. The first one is conventional problem solving, where the new solution (form) arises from an unknown value and an unknown working principle (function). In the second type, the working principle (function) is also unknown.

The literature about the model does not explain clearly the terms 'needs' and 'values', and a specification of cultural values has not been made; more attention is paid to function and form. This is in line with Boradkar's observation that *'Traditionally, designers have defined the value of things from perspectives of form and function'. However, as design redefines its objective to be the creation of engaging experiences rather than physical products, value too gets redefined in broader terms'* (Boradkar, 2010, p.64). In Section 2.3.2, we will take a closer look at values and connect them with the cultural values explained earlier in Section 2.1.2.

Primary and secondary functions – Muller (2001) distinguishes between a product's functions. Primary functions refer to the primary mode of use that a product denotes on a prototypical level. Secondary functions are an extension of the primary function, and denote the meaning of products on a behavioural level. He uses the phenomenon of culture as something that influences how people give meaning to products (and this is related to their secondary functions). This distinction is mentioned here because for more than twenty years the distinction has been taught to IDE design students – those involved in the cases presented in Chapter 3. Muller's meaning-giving process is explained with theory from semiotics. Here, culture is defined as *a skill shared by a group of people to recognise, interpret and produce signs in a similar way* (Ditto, p.53 in Muller,

The forms of products, eliciting a specific meaning that is determined by socio-cultural factors, is illustrated by Umberto Eco's example (Eco, 1972, p.298) regarding toilets in rural areas in Italy. Unfamiliar with this product, people used them to wash olives. They did not recognise the intended function. This example illustrates the need for designers to bridge the gap between form and what people know, their frame of reference. As Muller writes: *'This has consequences for any designer of products. Despite the prerequisite for originality, (s)he is always confronted with the need to base the way for a design to function also on available, and therefore known, expectations. If (s)he does not, only directions for use can offer a solution. It does not imply that a designer should only resort to old and familiar forms, but there should be sufficient familiar elements present in new form concepts that enable the future user to make a link to precedents'* (Muller, 2001, p.315).

Figure 2.12 A product function that was not recognised as intended due to lack of familiarity

2001, p.314). According to Muller, there should be a certain level of familiarity with a product in order to understand the designer's intended meaning, and this familiarity is culture specific. This familiarity is defined as '*a practice "regulated" on the basis of expectations and customs, "agreement" about the way of interaction with our external world that forms the basis for the communication in a cultural community*' (Muller, 2001, p.335). An unintended use due to unfamiliarity is given in Figure 2.12. For this research, the definition of culture will not be limited to the culture-specific meaning of material form and its familiarity to a specific group, but will go a step further by including the culture-specific values that are mediated through products (see also values in Section 3.2.2). The distinction between primary and secondary function will not be used, because in the reasoning from cultural values the functions are automatically considered from the perspective of cultural significance.

Product categorisation and design styles – Muller introduced a typological model that, at first glance, seems to be helpful for designers and for this research. The model helps designers to look at products and product categories in three ways: prototypical (function), behaviour typical (use, interaction), and solution typical (form). In line with theory from cultural anthropologists, the categorisation is situational or context related, depending on time and place and on the state of the observer (Muller, 2004, p.171). Prototypical features of a product type are reasonably stable, from a historical and cultural point of view, while behaviour-typical categorisations are influenced over time by socio-cultural changes. The solution-typical categorisations are influenced mainly by technological developments. Within the behavioural-typical categorisation (which is related to Muller's 'secondary function', denoting the meaning of products on a behavioural level), three levels on which to categorise design style are distinguished (see Figure 2.13): socio-cultural (typifying the context of use such as 'domestic interior' and 'outdoor products'), historical (typifying the point in time, such as 'gothic', 'classic', and 'high-tech'), and pragmatic (typifying the socio-psychological experience such as 'easy', 'rational', and 'feminine').

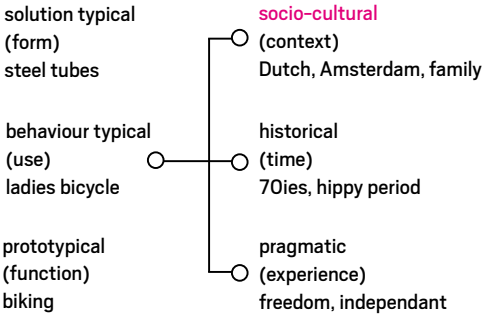


Figure 2.13 Overview of Muller's categorisation (Muller, 2001)

This model is useful for designers because it provides different lenses to examine products. Each lens will help the designer to ask specific questions, and the answers can be input for design. However, for the purpose of examining cultural values, this model is confusing. The term 'socio-cultural' is used on different levels, and culture is not approached on the level of shared cultural values (as in previously mentioned models such as the onion and the iceberg). The models on culture presented in Section 2.1 cannot be linked easily to this model. Furthermore, the aim here is to help designers examine culture on the level of values that are shared by a specific group. For example, in Muller's model the design of a domestic interior focuses on a shared kind of behaviour and on a common understanding of what is considered domestic by a specific cultural group. It does not refer back to underlying and deeply embedded cultural values. So viewed, the model is closer to cultural groups distinguished by different lifestyles. Therefore, although it is important for designers to understand the lifestyles of intended users, this aspect – as stated in Section 2.1.2 – will not be part of the cultural understanding explored in this study.

Neither Muller nor Roozenburg and Eekels offer a model and method to start from a more generic level that helps designers to reason from cultural values via functions to forms. It would be helpful if we could provide a list of culture-specific values useful for reasoning from cultural value to forms (right to left in Figure 2.10), or a method to enable designers to determine those cultural values. Here lies an opportunity for the present research. Can we connect the material culture (form and properties) to the people who give meaning to it during use (cultural values) in such a way that it helps designers in their reasoning process (in Figure 2.10 from left to right as well as from right to left)? What if we could offer designers culture-specific questions (and ways to find answers) that do not begin from the material culture but from cultural values? Could it help to avoid blind spots, the things that designers should know in order to avoid cultural mismatches between users and product? And, also important, are there other opportunities for designers, meaning that cultural insights can be inspiring as well?

2.2.2 User-centred design methods

This section discusses existing design-research methods used to understand the culture of intended users. Three developments are discussed:

- User-centred design methods and culture;
- User-centred design methods tuned to local cultures;
- User-centred design-research methods in a BoP context.

User-centred design methods and culture

Ten years ago, design methods paid little attention to culture. For example, a lifecycle method, such as the Process Tree (a schematic diagramme of activities that a product encounters during its life cycle and used to map and cover all aspects that need to be taken into account) does not suggest design-research

activities related to social and cultural values. The Process Tree includes activities related to the user, such as buying, storing, maintaining, and repairing, but a connection with cultural preferences is not made. Checklists for the development of design requirements, such as the checklist of Pugh, that accompany such a Process Tree also do not include culture-related points of interest other than questions related to '*aesthetics, appearance and finish: What are the preferences of the consumers? Should the product fit into a product line or house style?* And related to *social and political implications: What is the public opinion with regard to the product?*' (Roozenburg and Eekels, 1995, p.151-152).

The Fish Trap model (Muller, 2001, p.196-213), suggests that an understanding of the culture of intended users is constructed in the act of designing, as it focuses on their material culture. The model helps to generate material concepts that determine the geometrical form of a design. The model shows a process of converging, diverging, and categorising, by metaphorically referring to a fish trap to 'catch a solution'. It describes how on three different levels (topological, typological, and morphological) forms can be generated and analysed, and design criteria can be developed simultaneously. The development of collages is recommended as a tool to both analyse and generate the *material culture* of intended users. Three examples of results of analyses and syntheses of material cultures by design students that are based on his theory and model are given in Figures 2.14 and 2.15.

For the master design course Design Manifestation (Bos and Jacobs, 2006), students were asked to design a product from a specific product category for a cultural group that initially did not match with the product category: for example, 'high-tea set for offshore workers', 'poop-scoop for pit-bull owners' or 'sandals for business men'. The aim was to understand the material culture, including product-user interactions, of the target group, and to gain insights into the possibilities for conceptualisation, based on Muller's theory (2001). The design students learned to use means such as colours, textures, sizes, materials, and functions to evoke meaning for a specific cultural group. The students used no specific methods to study the culture of their intended users other than analysing a collection of internet-sourced images of the current material culture of the product category (for example, high-tea sets) as well as of the specified target group (for example, offshore workers).

The examples show the disparity between a product category and a user group, along with the designer's attempt to bridge the cultural gap. The focus of the designer is on the material culture, and not so much on deeper underlying values that people who belong to the same group share. Or at least they are not made explicit. The method as such does not help designers to explore the more deeply embedded cultural values, since the designer's thinking remains at the 'symbols' layer of Hofstede's onion model.

Sandals for business men

A poster presentation of the analyses of the material culture of both business men and sandals (left) and the proposed design (right). The example shows the designer's attempt to bridge the cultural gap between a product category (sandals) and a user group (business men).

Designed by Maarten Kamphuis, 2008

High-tea set for offshore workers

A poster presentation of a high-tea set for offshore workers.
The example shows the designer's attempt to bridge the cultural gap between a product category (high tea set) and a user group (offshore workers).

Designed by Paul Baak, 2006

Figure 2.14 Examples of results of a culture-related study in the master course Design Manifestation, using existing material cultures as a starting point

The focus on product users and their social context has grown rapidly in the last ten years, with context- conscious design becoming increasingly important. As a consequence, the curricula for product design have diversified, and new methods of studying intended users and their contexts have been developed (DUT-IDE Study Guide, 2013/2014). Most methods are based on real-life situations

Poop-scoop for pit-bull owners

Step 1 – Analysis of current poop-scoops and inter-action with users

Step 2 – Analysis of the material culture of pit-bull owners

Step 3 – Product-user interaction design: pit-bull owner and poop-scoop interaction

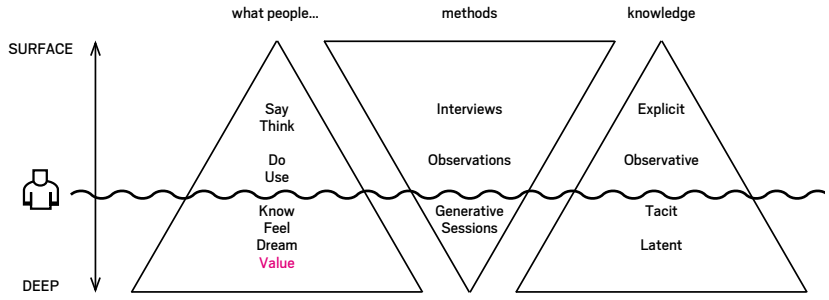
Step 4 – New poop-scoop design for pit-bull owners

Designed by Marcella Beusekom, 2006

Figure 2.15 Examples of outcomes of the design assignment 'poop-scoop for pit-bull owners' for the master course Design Manifestation, using existing material cultures as a starting point

and current practices, and a few have been developed to assist in understanding the cultural context. Designers go to the local context of their intended users to learn about their daily practices and specific needs and dreams, using standard methods such as observations, interviews, and questionnaires. In addition, participatory design-research methods such as Contextmapping (see Figure 2.16) are used. However, they do not provide a lens appropriate to distinguish cultural values. Furthermore, they focus only on individual and current practices, and do not scrutinise the deeper underlying shared values of a specific group.

Martin and Hanington made an inventory of one-hundred methods (2012). Four of the one-hundred methods are addressed specifically to culture-specific aspects: Artefact Analyses (analysing a material culture); Design Ethnography (describing daily practices, including diary and photo studies, cultural probes, contextual inquiry, and various forms of observation); Image Boards; and Cultural Probes (Gaver, 1999). Obviously, other methods mentioned in the book contribute to building an understanding of users, and consequently about cultural groups. However, the methods do not help the designer to examine people as members of a specific cultural group. At the same time, increasing attention is being paid to people as members of a social group. Postma writes: *'Most work on user experience, including work with contextmapping techniques, has focused on individual needs and dreams; less has been done on understanding social-cultural processes between people'* (Postma, 2012). In addition to Personas (archetypal representations of intended users, describing and visualising their behaviour, values, and needs) (Cooper 1999), Postma developed Socionas that represent people as members of a social group and not as individuals. In line with this, we could think of *Culturas* that specifically represent the culture or cultures



Contextmapping involves generative research techniques, created to gain insights into and to achieve a rich understanding of the context of use of products by people in their everyday lives. The goal of these techniques is to explicate tacit and latent knowledge about people's everyday experiences, knowledge that even the people themselves would not come up with immediately. This knowledge is meant to provide inspiring information that will lead to good ideas for the conceptual phase of design and product development. Through a series of sessions with intended users, designers gain insights into the knowledge, feelings, and dreams of these users. Creative tools or self-documentation techniques help people reflect on their memories, feelings, and motivations, and assist in creating people's awareness about their experiences (Sleeswijk Visser et. al., 2005)

Figure 2.16 Contextmapping techniques help designers to understand different levels of knowledge, including latent ones that are related to cultural values of the intended users (after Sleeswijk Visser et al., 2005)

to which a person belongs. I envision that such a Cultura communicates not only the material culture of a group of intended users but also the cultural values that are important to or dominant in the group. In Chapter 6 this notion of Cultura will be further elaborated on.

User-centred design methods tuned to local cultures

Design students involved in BoP projects regularly ask me if their design methods can be used, doubting whether creative sessions and cultural-probe homework booklets will work in other cultures as intended and practiced in the Netherlands. Van Rijn et al. (2005) reported the need to tune methods to the local cultural values. Barriers encountered during contextmapping sessions in South Korea led to guidelines regarding adjusting the methods of overcoming these barriers: for example, by designing objects that stimulate self-expression in a group. 'User research techniques based on Western models of thought must be adapted for Asian models of thought if conducting user research in China' (Courage and Baxter, 2005, p.196). The example in Figure 2.17 shows that an understanding of cultural values is relevant not only for the conceptualisation of products but also to bridge cultural chasms when applying user-centred design-research methods.

User-centred design-research methods in a BoP context

Contextmapping techniques (CM) have been developed in a Western context. In the cases studied, presented in Chapter 3, we will see that these techniques are applied in Western situations as well as in non-Western situations, such as in BoP projects (see Chapter 1). However, designers were not the first to go 'out there'. Crossing cultural boundaries and involving end-users had already played a role in rural appraisal techniques, such as Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) (Chambers, 1994, 1997, 2007). These techniques had been developed to support Western aid workers to help impoverished people in rural areas, who live in a context that differs considerably from the outsider's (Western aid workers) cultural background. The aim of these techniques was to help in analysing problems and possibilities regarding development in a variety of sectors: natural resource management, agriculture, urbanism, and health and

TV frame for role-playing

A 'turn to speak' tool

YES or NO game
chocolate coins, yes and no cards and a box

1 – A participant chooses to answer yes to a given statement

2 – He inserts the card face down to answer anonymously

3 – Here he chooses to express and holds *Kibun*

4 – He receives a chocolate coin as an award for expressing

A 'yes-no' & reward tool

During contextmapping sessions to understand the needs and dreams of intended users in South Korea, participants had difficulties in expressing opinions, since self-expression is not encouraged in Korean culture. Extra tools were designed to build on trust, supporting free communication: namely, an object that mediates the message 'it is your turn to speak', an object that helps in saying 'yes' and 'no' and gives rewards, and a television frame that places participants in a role-playing setting.

Figure 2.17 Contextmapping technniques tuned to the local culture (van Rijn et al., 2005)

nutrition. For example, in the context of health prevention, the International HIV/AIDS Alliance published one-hundred participatory tools (International HIV/AIDS Alliance, 2006; Unicef, 1993) based on PRA techniques. RRA, PRA, and CM can be seen as three sets of techniques, all basically developed to help understand people and their context in order to support the design of products to improve their quality of life. However, the RRA and PRA techniques were developed in non-design disciplines, with different starting points and described in various frames. We compared these two to determine how CM should be tuned to the cultural context. The research approach and results have been published (van Boeijen and Stappers, 2011b).

The comparison clearly shows that all three methods – PRA, RRA, and CM – were developed for outsiders to enable them to contribute effectively and efficiently to the quality of people's lives. All three types make use of group sessions and generative techniques using visual information, focusing on a relaxed situation with room for playful expression in order to gain a rich understanding of people's lives. The most outstanding difference is that PRA emphasises the importance of empowering local people. The PRA technique results are applied to support local people to use their own capabilities, while CM results are used mainly by the designers. Both sets of techniques elicit tacit knowledge, though CM focuses more on latent knowledge (see Figure 2.16) and uses more techniques to generate ideas, such as Cultural Probes, Personas, and Card sorting. In line with van Rijn et al. (2005), Chambers (2007) emphasises the importance of building on trust. The outsider's role is to gain respect and trust. As with CM, extra attention is paid to language issues and to the visual means, as well as to selection of the appropriate interpreter. Surprisingly, RRA and PRA do not indicate specifically how cultural values can be examined, although considerable attention is paid to avoiding the outsider's biases. These include not only biases about the intended users – for example, stereotypes that do not match with the real situation – but also in the selection of intended users and their context – for instance, based on 'a nice and easy to reach location' or 'people that can speak English'. Likewise with CM, attention has been paid to appropriate material, albeit based more on familiarity (trust) and availability. In addition, PRA emphasises the need to adjust to local people's perception of pace of time, which is much lower than outsiders are accustomed to. Especially in PRA, the importance of empowering local people to develop, using their own capabilities, is stressed. Thus, the elicitation of needs and dreams should not only support the design task but also motivate local people to mediate design and realisation processes. Finally, PRA stresses the importance of the outsider's behaviour and attitude: namely, the need to approach local people with an open mind, with respect, curiosity, and a capacity for alternative thinking, and not to waste people's time on the outsider's own interests.

A more recently published approach that designers use in BoP projects is the Human-Centred Design Toolkit and Field Guide (IDEO, 2013), designed specifically

for NGOs and social enterprises that work with impoverished communities in Africa, Asia, and Latin America. The toolkit offers exercises and checklists with question-and-answer forms, along with visuals to evoke storytelling by local people. The pictures (see Figure 2.18) are based on rural Asia, drawn in a way that the local people can recognise and understand them. The toolkit offers methods, accompanied by context-specific tips and guidelines. Similar to PRA and RRA, the tips and guidelines emphasise the outsiders' attitude of empathy and open-mindedness in order to create trust. Furthermore, the kit mentions repeatedly the importance of balanced attention to women and men (based on outsiders' values) and the need to take race and ethnicity, gender and hierarchy (class and income, the disempowered and the elite) into account in participatory sessions (based on insiders' values). However, the toolkit and guide do not explain how to examine and design with cultural values in mind, meaning that in the way it is presented it is of limited use for culture-conscious design.

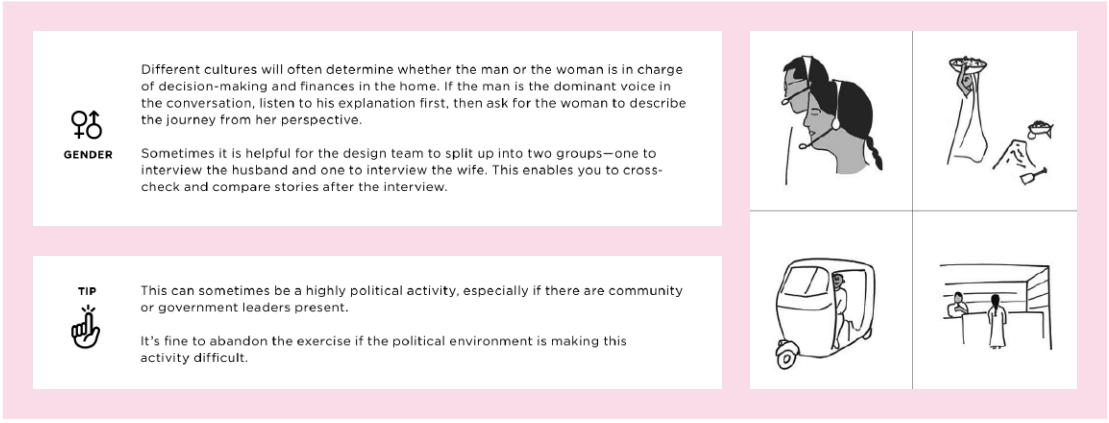


Figure 2.18 Examples of pages from the IDEO field guide, illustrating the importance of gender and local politics (left); pictures are based on rural Asia (right) (IDEO, 2014)

2.2.3 Cultural values in design

From the above-mentioned models and methods, we learn that more attention could be paid to understand not only the daily practices of intended users but also the underlying cultural values. A starting point for the research in this thesis is that designers need a lens that will help to identify these values. A clear definition of and distinction between cultural and other values is required. Boradkar (2010) recognised this need, and summarised the value types used in different disciplines (see Figure 2.19). For designers, these framed value types might seem artificial, and designers – as defined in this thesis – will not recognise these strict borders of disciplines. Nevertheless, in line with our choice to begin defining culture from the perspective of anthropology, this overview shows the kinds of cultural values positioned in this discipline.

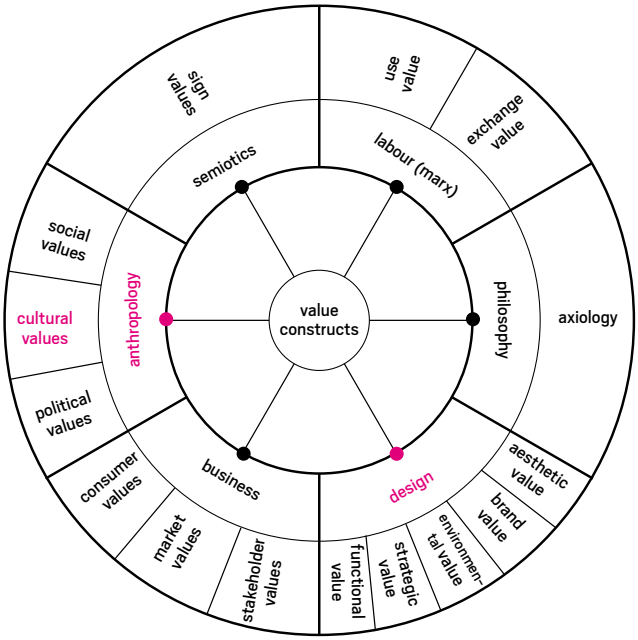


Figure 2.19 Disciplinary approaches to values according to Boradkar (2010, p.54)

A more complete overview of value types proposed by Boradkar for the design discipline is shown in Figure 2.20. The figure displays a list of value types, and the bicycle that here has been evaluated along these values. The lengths of the bars indicate the importance of a specific of the bike value relative to others (applied in a specific context). The example demonstrates that the cultural value of a product is only one part of a bigger whole of concerns of a designer.

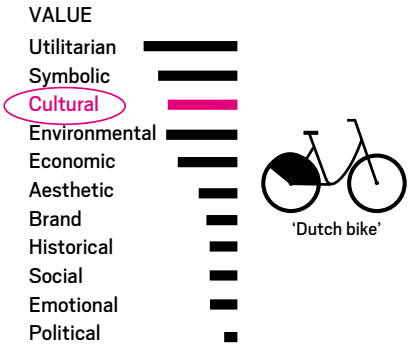


Figure 2.20 Example of a value evaluation regarding a bike (applied in a specific context) (based on Boradkar (2010, p.51))

Botztepe (2007a, 2007b) discusses the designers' need to distinguish different values for users in a variety of cultural contexts. In her model cultural value is not a distinct value type, but overarches her four values. She distinguishes four user-value categories: (1) utility value (convenience, quality and performance, economy), (2) social significance value (including identity), (3) emotional value (affective benefits), and (4) spiritual value (supernatural benefits). The values were derived from a comparison of the use of refrigerators in Turkish and American families. For example, logos and prints showing the temperature settings on many Turkish refrigerators had been erased and dials had popped out over time due to daily cleaning with a strong detergent. The utilitarian value (performance) of the refrigerator had been decreased because of the social value (the attitude towards hygiene in kitchens). Boradkar presents cultural values on the same level in a row with symbolic, emotional, economic, historical, aesthetic, social, political, environmental, brand, and utilitarian values (Boradkar, 2010, p.50-52) (see Figure 2.20).
Various design researchers have attempted to use Hofstede's dimensions as a guideline for analysing cultural values, and thus to explain certain cultural differences in product design. For example, Razzaghi et al. (2008) show how concept designs (telecommunication devices) from Australian and Iranian students differ as a result of the designers' different value orientations. Gall et al. (2012) go one step further with their attempt to use the differences in value orientation as 'actionable principles' to design 'glocal' office workplaces. The last examples are in line with what we are looking for.
The examples show the complexity of using cultural values within the design discipline. For now Boradkar's view on values has been chosen and selected as an element for the first-stage framework. This will further be explained in Section 2.3.2.

2.2.4 Importance of culture-conscious design

One can question the importance of cultural differences in design. Some argue that constants and commonalities in people's behaviour, thinking, and feeling need to be understood first before designers can begin to look at and design for cultural and individual differences. Hekkert writes that designers over-emphasise cultural differences, because the communalities are more difficult to see 'something that is not moving is hard to perceive' (Hekkert, 2009). The memory game designed by Sara Emami (Figure 2.21) illustrates the importance of similarities rather than differences (Hekkert and van Dijk, 2011, p.300-303). This is in line with Pinker (2002) and also the anthropologist Brown, who writes: *'…because everybody likes to hear that 'they' are different from 'us', anthropologists dwell on the differences… That humans share so many similarities, and that many if not most anthropologists have left them in the background – or even denied them – points to some anthropological issues that need to be discussed'* (Brown, 1991, p.5). And indeed designers, when designing in a culture-conscious manner, should not dwell on differences only, overlooking the importance of understanding

The memory game designed by Sara Emami illustrates the importance of similarities rather than differences (Hekkert and van Dijk, 2011, pp. 300–303). The idea sprang from her desire for people to understand what they have in common rather than what makes them different. The game indeed reveals commonalities that designers should understand. However, regardless of Emami's intention, the game also highlights the importance of different cultural values.

Figure 2.21 Memory game showing commonalities within cultural differences (designed by Sara Emami)

generic behaviour, because focus and acceptance of differences can also lead to cultural relativism: the view that all beliefs, customs, and ethics are relative to the individual within his/her own social context. 'Right' and 'wrong' are culture specific; what is considered moral in one society may be considered immoral in another, and, since no universal standard of morality exists, no one has the right to judge another society's customs. This cultural relativism is problematic, however, because a designer – as an outsider, and trained to change that which exists – would feel highly constrained. If you do not determine what is good, how then can you make things better? It is the researcher's opinion that designers need to be aware that it is almost impossible to design in a way that is free of cultural values. Designers are partly formed by the cultures in which they are raised, and are influenced by the cultures they are required to deal with. This then poses the question as to what the designers' intentions are in terms of understanding culture, and to what extent cultural understanding is necessary. The results of case studies presented in Chapter 3 will shed light on the issue.

2.2.5 Reflection and stance

Ample knowledge is available that designers can use to design in a culture-conscious way. However, the information is scattered and often inaccessible. There is a great deal of divergent jargon, and the different use of terminology also reveals disagreement. Furthermore, models and methods are scarce, focusing mainly on material culture and cultural practices, and seldom on how designers can understand the underlying cultural values and subsequently how these understandings can be applied in the design process. A lens with which to examine culture on that level is lacking. Comparing this with the growing internationalising context that designers are working in and for, it can be concluded that there is room for a framework and a tool to support designers in their goal to create culture-conscious designs.

2.3 Conclusion – A first-stage framework for culture in design

This section concludes with a summary of findings and with a framework that will be used to study culture further in the design practice.

2.3.1 What did we find in the literature?

This chapter demonstrates how culture can be understood in the context of the design discipline in order to understand the culture of intended users. It discusses an overview of the different models and methods that are available for designers to deal with culture in design processes.
The literature shows that a systematic approach and guidelines to understand cultural values and to reason from these values to the form is underserved. Therefore, the aim of this research is to develop an additional model that supports the designer's reasoning process, along with a tool that helps in understanding the cultural values and practices of intended users, be it the similarities or differences with the designer's culture. For all of this, a clear framework is needed. The first-stage framework is based on the literature study presented in this chapter, and is explained further in the next section.

2.3.2 A first-stage framework

For this framework, six key components are selected (see Figure 2.22): [1] definition of culture; [2] cultural boundaries; [3] cultural values; [4] cultural values and practices; [5] dimensions (to typify culture); and [6] reasoning in design (from cultural values to form and vice versa). The aim of the framework is to provide a lens for both researcher and designer to examine culture. The selection of elements is based on insights from the literature as described in this chapter, which resulted in the following criteria regarding the framework: [1] it should demonstrate clearly how culture is defined in a useful way, and, because the definition of culture should be in tune with designers' interests, it is formulated

in a way that illustrates a connection between social values and material manifestations; [2] It should indicate that the designer examines intended users as delineated groups; [3] it should show how cultural values are distinguished from other values; [4] it should demonstrate how cultural values are related to products; [5] it should highlight how cultural values might differ between cultural groups; and [6] the cultural values should be related to designers' reasoning processes.

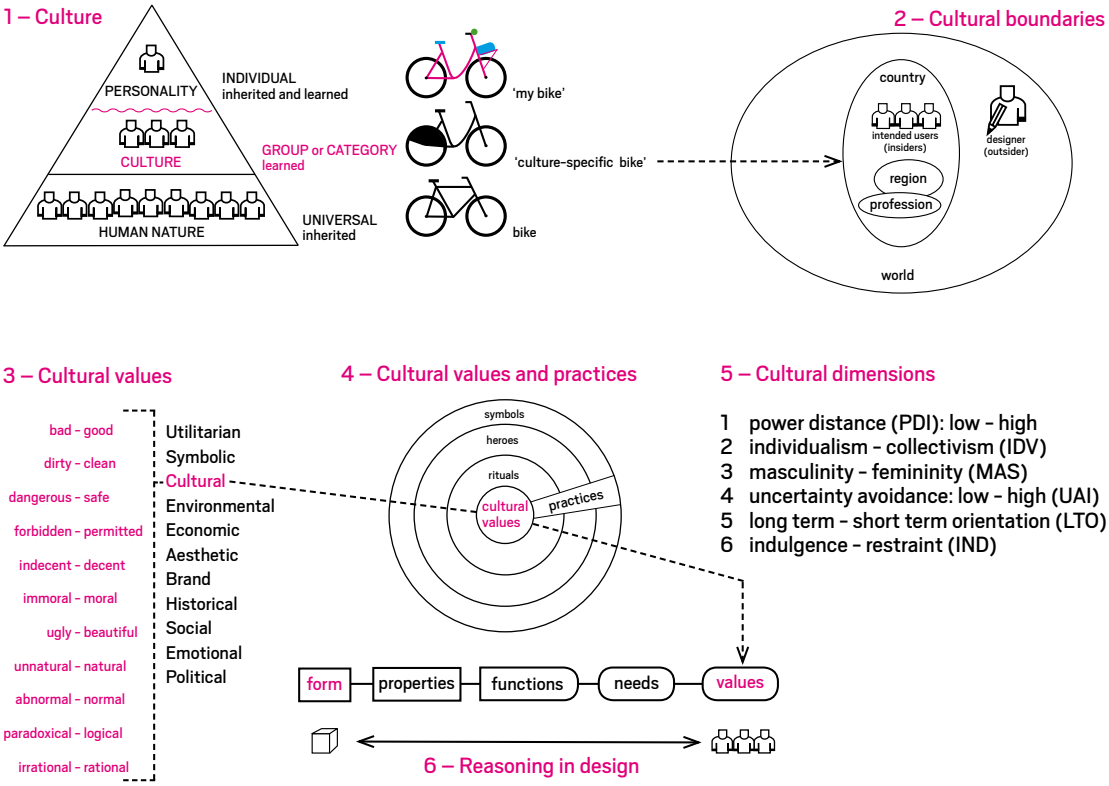


Figure 2.22 A visualisation of the first-stage framework

The first-stage framework is visualized in Figure 2.22. The dashed arrows show the matching aspects between the different elements. The elements are explained below:

1 **Culture** – The following definition has been chosen: *The system of shared beliefs, values, customs, behaviours, and artefacts that the members of a cultural group use to cope with their world and with one another, and that are transmitted through learning* (based on Bates and Plog, 1976). As discussed in Section 2.1.1, this definition fits within the aim of the present research.

2 **Cultural boundaries** – The boundaries or levels show that specific cultural groups can be distinguished. In this thesis, the focus is on cultural groups that share deeply embedded values that are determined more by nation, region, and profession than by rapidly changing values based on short-term trends such as in lifestyles. The designer in this research is always the outsider who is not familiar with and not a member of the cultural group; the intended users are the insiders that are members of one or more cultural groups.
3 **Cultural values** – The term 'value' refers to a fluid relationship between people and products that is situational, depending on the environment, time, and place (Boradkar, 2010, p.45-74). The following definition has been chosen: *'A cultural value is a collective tendency to prefer a certain course of events above another one, expressed by opposite qualifications such as good and bad, dirty and clean, ugly and beautiful'* (Hofstede, 2005, p.404). Cultural values are seen as part of a set of values as defined by Boradkar (2010, p.51), such as Economic, Utilitarian, and Brand values. Hofstede's value checklist is included because it seems helpful in generating design-relevant questions (see Figure 2.6).
4 **Cultural values and practices** – Another aspect of the framework is the fact that culture is manifested in layers. The layers in Hofstede's onion model offer distinctions that help designers to understand cultural practices, that provide insight into the underlying cultural values, and that help designers to understand how cultural values can be influenced by design. Chapter 3 presents results from experiments using this model. The strength of Hofstede's model is that it clearly distinguishes cultural practices – the domain that designers influence – and the practices' underlying cultural values.
5 **Cultural dimensions** (to typify culture) – Hofstede's dimensions are a starting point to typify cultures: namely, the way one group is distinguished from another. These dimensions help to determine if the barriers that designers encounter in the design process are cultural or not. Reasons for selecting this model are given in Section 2.1.3. In Chapters 3 and 4, we will see how this model contributes to the research, as well as its limitations for the application of this model in the context of a design project.
6 **Reasoning in design** (from cultural values to form and vice versa) – The reasoning model (Roozenburg and Eekels, 1998, p.58) is an important element in the framework, as it links the cultural theory to the design discipline. The model shows the five key levels (form, properties, functions, needs, and values) upon which designers focus. In contrast to the original model, the arrow shows the two-way reasoning (analysing and synthesising). The distinction made in the original model between extensive and intensive properties has not been adopted, as it makes the framework unnecessarily complex. The dotted line with arrow indicates the focus on cultural values in the reasoning model, as defined in element 3.

Additional starting points as to how culture is approached in the present research are:

1 Cultures, and consequently cultural values, are not static; they change over time and are context specific;
2 Designers contribute to cultural changes by means of their designs;
3 *The* 'culture' of an individual person in a group does not exist. Each person belongs to a different group, and all of these differ culturally. People share diverse mental programmes in different groups to which they want to belong, and these programmes are grouped by, for example, nation, region, sex, generation, social class, sports and profession;
4 There is an overlap between individual and cultural values.

2.3.3 From theory to empirical reality

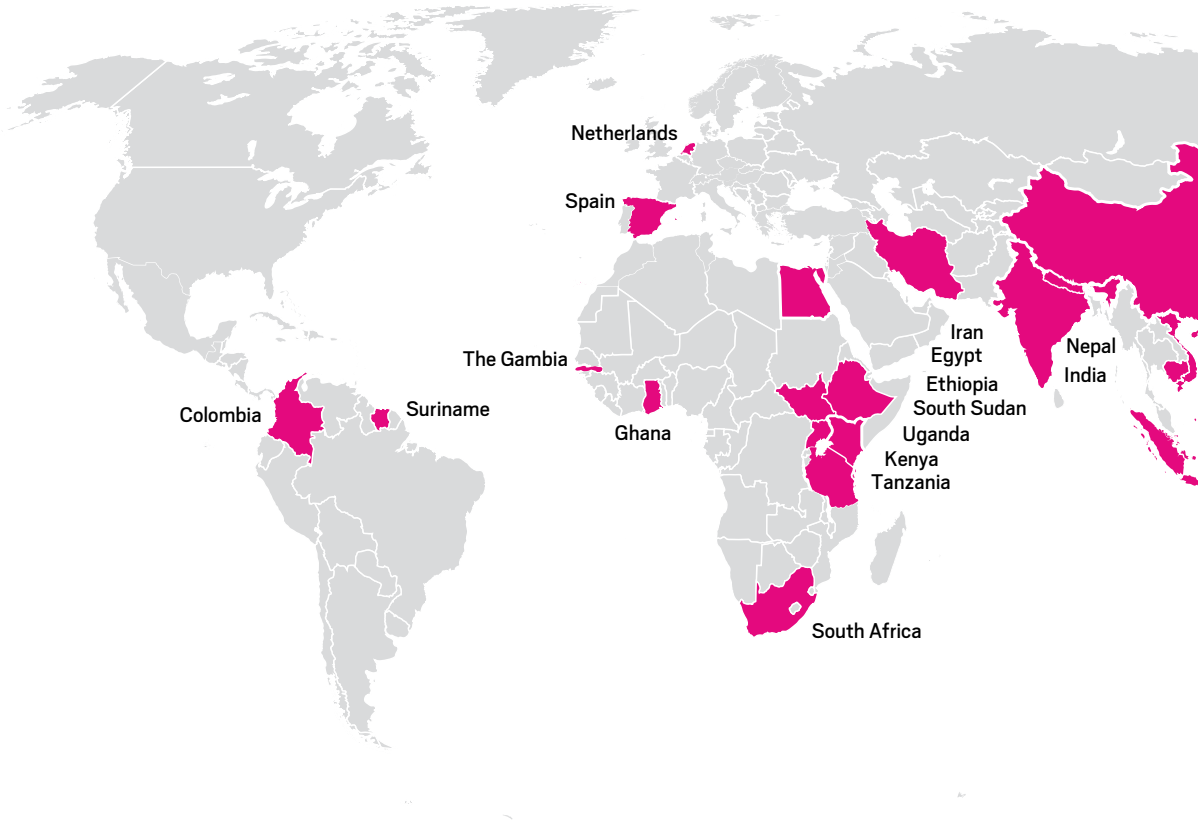
Now that we have a basic understanding of the concept of culture, as well as a proposal regarding how to examine it, we move to the design practice. There we will determine what designers do, so that we can learn how best to help them in terms of designing in a culture-conscious manner. With the support of the framework, answers to three questions will be sought:

1 **What are the designers' reasons as regards taking culture into account?**
For what reasons do they examine the culture of their intended users? What are they aiming for? What opportunities exist for culture-conscious design?

2 **How do designers handle the concept of culture?**
What barriers do they encounter and what solutions to they come up with?

3 **What do designers do to understand the culture of their intended users?**
What methods and tools do they use? What barriers do they encounter, and what solutions do they come up with?

Answers are found in a comprehensive study of cases presented in the next chapter. The usefulness of the framework will be given during the study of the cases. Insights from these will constitute input regarding further development of the tool and also the framework. Thus contribute these questions to the Design Inclusive Research approach.


Netherlands
Spain
The Gambia
Colombia
Suriname
Ghana
Iran
Egypt
Ethiopia
South Sudan
Uganda
Kenya
Tanzania
Nepal
India
South Africa

C3 What is to be found in practice?

Towards insights geared to help designers deal with culture-related aspects

Chapter 2 discussed culture-related models and methods used within the design disciplines, along with what can be learned from models and methods developed within the discipline of cultural anthropology. The chapter ended with the proposal for an initial framework involving the concept of culture for the design discipline. This framework will serve as a type of microscopic lens through which to examine culture in the design projects presented in this chapter.

As stated in Chapter 1, the aim for this thesis is: *to help designers who are engaged in a project in which they are unfamiliar with the culture of their intended users.* The focus is on understanding the culture of the intended user. In short, we want to know how designers deal with cultural aspects in a context in which the cultural chasm between the designers and their intended users is large. The studied cases presented in this chapter contribute to an understanding of these chasms, as well as to solutions that designers implement to cross them, and to the opportunities for culture-conscious design. The insights help us to zoom in on the culture, and to generate guidelines for the development of a tool that will benefit designers.

The current chapter is structured as follows. Firstly, Section 3.1 provides an overview of the research approach to the empirical study. Secondly, Section 3.2 explains how each set of cases was studied. Subsequently, Sections 3.3 to 3.5 present insights gleaned from all cases, clustered into three categories. The chapter ends with a discussion and conclusions and the announcement to the next step in this thesis (Section 3.6).

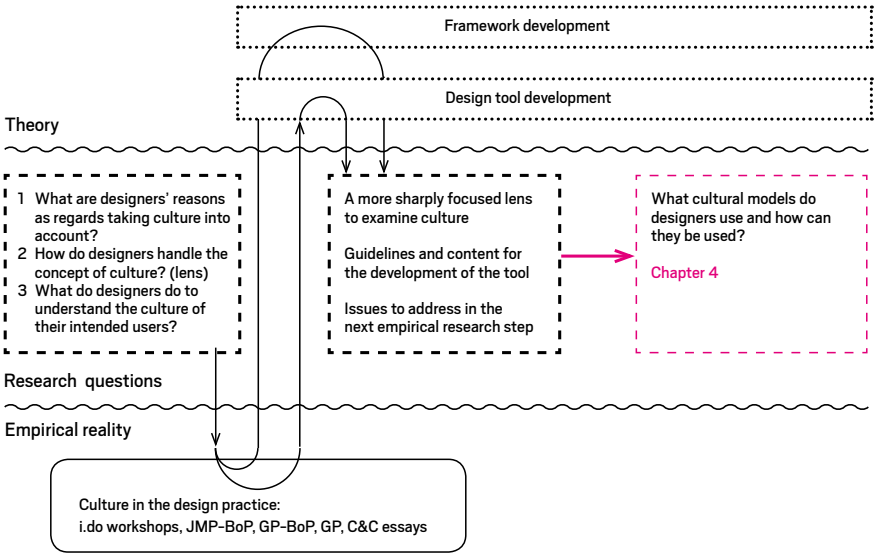


Figure 3.1 Overview of research activities presented in this chapter

3.1 Research approach – General outline

Figure 3.1 provides an overview of research activities, from practical reality (empirical) to theory, starting with three research questions:

1 What are designers' reasons as regards taking culture into account? (Section 3.3)
2 How do designers handle the concept of culture? (Section 3.4);
3 What do designers do to understand the culture of their intended users? (Section 3.5).

Insights will contribute to the development of a cultural framework and tool. This chapter ends with:

- A more sharply focused lens to examine culture, thus contributing to the framework development;
- Guidelines and content for development of the design tool;
- Issues to address in the next empirical research step.

In Chapter 4, we will return to studied cases to see what cultural models designers use and how they apply them. Outcomes of experiments involving the application of framework elements will also be presented in Chapter 4.

3.1.1 Studied cases – Five sets

The research questions have been applied to a large number of cases (Appendix 1), in total adding up to 4 workshops, 35 projects and 31 essays. All of these involve educational design projects in an international setting, and were selected for the following reasons.[7]

Practicalities

All these projects were accessible, within reach, and in the context of the researcher's occupation. This made it possible to monitor closely and evaluate the design process and results, using documentation material and personal input from the designers. An advantage of working with young and inexperienced novice designers rather than those in a professional design practice was that they encountered more barriers, which were greater and therefore easier to identify.

Common characteristics

The workshops, projects and selected projects in the essays were all international in which the culture of the intended users differed considerably from that of the designers. The projects were close to the professional design practice, which was preferred because it made the designers' input substantial and the projects as realistic as possible. A difference regarding the professional designers might have been that design students were less restricted and had more time to do design research.

[7] In this thesis a single workshop, a project or essay is called a case.

Variety
The studies cover various cultures (featuring different countries, professions, and economic situations) involving intended users, as well as a broad palette of methods that designers used to understand the culture of their target users.

There are five sets:
Set 1 – International Design Opportunity workshops (i.do)
Set 2 – Master Projects-BoP (JMP-BoP)
Set 3 – MSc Graduation Projects-BoP (GP-BoP)
Set 4 – MSc Graduation Projects (GP)
Set 5 – Context and Conceptualisation essays (C&C essays)
Figure 3.4 provides an overview that also illustrates the number of studies per set and the kind of research activities. Each single case has a number that is a reference used in this chapter. For example, case 3.2 refers to the Graduation-BoP projects, set 3, case 2. In the text indicated with [case 3.2]. Appendix 1 gives an overview of all cases, including the year and topics for each one. The Reference Cases section shows the list of references to the project reports, including students' names, date of issue, and project title.

The design projects were carried out in an educational setting, mainly by second-year master design students from the faculty of Industrial Design Engineering at Delft University of Technology. Most projects ran for about six months. The majority of the cases were BoP projects from the Joint Master Projects (JMP-BoP, 15 cases) and Graduation Projects (GP-BoP, 15 cases; GP, 5 cases). The reason for selecting mainly BoP projects and international projects was that the cultural gap between the designer and the intended users was expected to be large. Indeed, design students starting such projects also anticipated that they would need to bridge a cultural gap. They also questioned whether design methods that they had learned to use in order to understand the needs and aspirations of their intended users could be applied, and whether commonly held stereotypes were reliable. Two other sets were the Context & Contextualisation essays (C&C, 17 essays) and the i.do workshops (i.do, 4 workshops, 18 cases). An i.do workshop was conducted over a period of four to six weeks by Delft students, together with those from design schools in other nations. In these cases, the cultural gaps between designers and their intended users were also large. For the C&C essays, master design students in the C&C course evaluated cultural barriers in their own BoP design projects as well as those of fellow students.

The cases are indicated in the text by square brackets – for example [Hong Kong student, case 1-3, quote 265] – indicating the respondent's country of origin, and reference to the case-set number, the case number, and the quote number from the transcribed interview. They refer to the corresponding reports listed in the Reference Cases section.

3.1.2 Researcher's role

The cases were examined from the perspective of both an insider (closely involved in the projects) and an outsider (observing from a distance). This means that various research methods have been used (Sleeswijk-Visser, 2005, pp. 71-72). Cases in question were monitored during the project (reading intermediate reports and attending intermediate presentations), reports were reviewed, and designers were interviewed. Several projects were supervised or coached (see overview in Figure 3.4), and involved the researcher's role as design educator (as indicated in Figure 1.21 in Chapter 1). The advantage of being supervisor or coach was that it was possible to find and have access to suitable cases, and to examine them closely. A disadvantage might have been that the design students were influenced by input from the supervisor. On the one hand, for example, some cultural barriers might not have occurred, because in discussions with the coach, students were already conscious of possible barriers. On the other hand, this situation allowed the introduction of cultural models to experiment with in order to determine how meaningful they were for design projects.

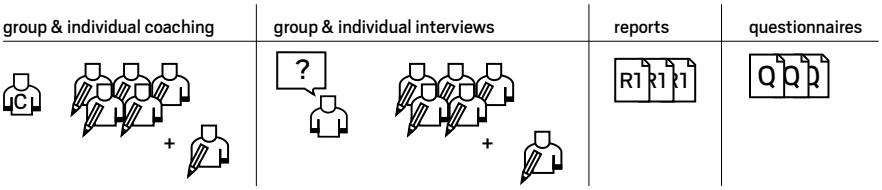


Figure 3.2 Data sources used

3.1.3 Data and analyses

Most data from the case studies are of a qualitative nature, based on the monitoring of design projects, interviews with designers, design reports, and results from questionnaires (see Figure 3.2). Questionnaires from the i.do workshops also resulted in quantitative data. Data were coded, clustered into themes, and finally translated into practical information that could be used for development of the framework and tool. The data analysis was an iterative process. Together with other researchers, I referred back to the cases several times, sometimes re-clustering data and re-reading reports and interview transcripts. The intermediate results were published, and are referred to as stage A in the research for this thesis (see Figure 3.3). In a second round for this thesis, stage B, I returned to all the data. Again, a new clustering of findings resulted in the three categories presented in this chapter.

Figure 3.4 visualises the number and type of cases studied, clustered into five sets. The squares represent the number of workshops, projects and essays, and the characters indicate what has been analysed; see legend. For the i.do workshops, 18 teams were interviewed and questionnaires were used. For the JMP-BoP,

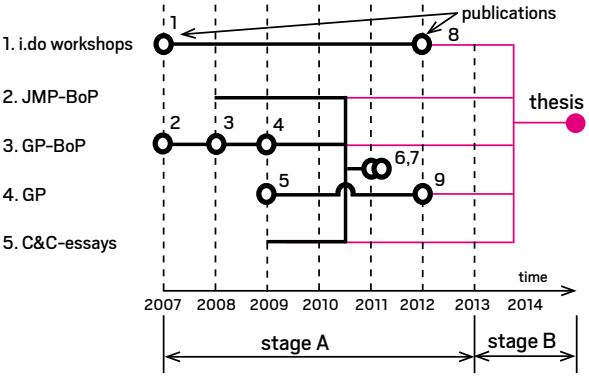


Figure 3.3 Five sets of cases and two stages: In stage A, sub-studies were conducted and published, totalling nine publications; in stage B, data were analysed anew

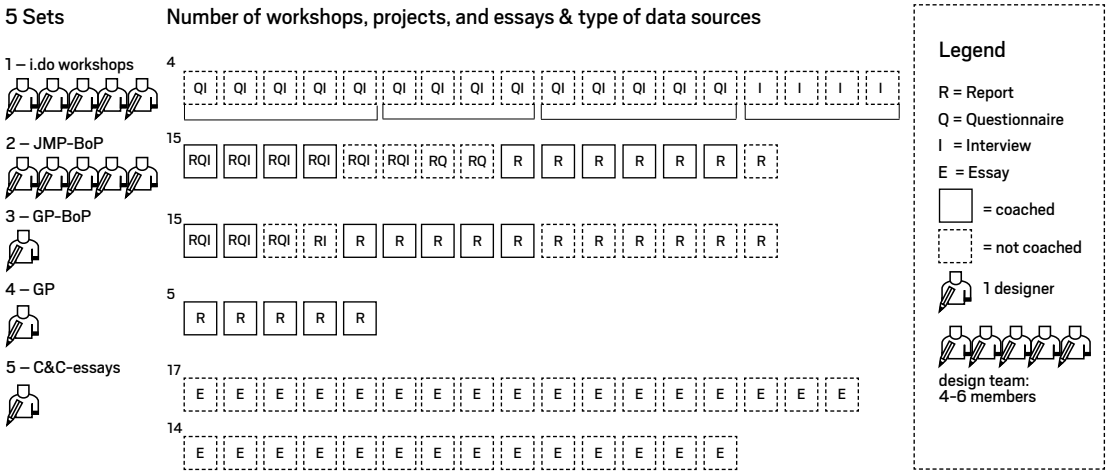


Figure 3.4 Overview of the five case sets

15 projects were studied, four of which were based on reports, interviews, questionnaires, and coaching; six cases were based on reports and coaching; four were based on interviews and questionnaires; and one was based on a report. For the GP-JMP, 15 projects were studied: one was based on a report as well as on an interview, questionnaires, and coaching; one on a report and an interview; six on reports and coaching; seven on interviews and questionnaires; and one was based solely on a report. For the GP, five projects were studied, all based on reports, interviews, and coaching. For the C&C essays, 17 essays were analysed. For an overview of all the cases and the number of students involved, see also Appendix 1.

3.2 Research methods – Further details of five sets

Further details for each set of cases, introduced in Section 3.1, are given below. These begin with the i.do workshops, because this study was the first wide-ranging work that contributed to a better understanding of the cultural dimensions (element of the framework). Subsequently, the BoP projects (from JMP and GP) – the most comprehensive and most extensively studied – are explained, followed by the GP international projects (non-BoP). This section ends with an explanation of the C&C essays.

Intermediate results (stage A) of the studied case set were published. A summary can be found in Appendix 2.

3.2.1 Case set 1 – i.do workshops (i.do)[8]

The first project (i.do workshop) was carried out in 2005, and one graduation project was conducted in 2006. The other projects ran between 2008 and 2012.

The acronym i.do stands for International Design Opportunity. Every year from 2005 to 2012, students from different countries and design schools worked in multi-cultural teams for 4 to 6 weeks at the PolyU School of Design in Hong Kong-China. These workshops were relevant for the present research, since it was already clear that the cultural gap – between design team members as well as between the designers and their intended users – would be substantial. Three of the four i.do workshop results were reported (i.do, 2005; i.do, 2008; i.do, 2009) and the i.do approach was published in a conference paper (Bracht et al., 2008).
Setting – Since 2005, different institutions have been invited worldwide each year to participate, along with four students plus staff. For six weeks, with one exception of four weeks in i.do 2005, teams of four to six students, varying in age from 20 to 25, and from different countries and schools, worked together on a design project. Table 3.1 shows an overview of the students participating in this study. Students had a great deal of freedom to steer the process and the outcomes – only intermediate and final results were clearly defined. The i.do workshops were usually held in Hong Kong at the PolyU School of Design, but in 2008, the final three weeks were spent at the DUT faculty of Industrial Design Engineering.

[8] van Boeijen, A.G.C., Badke-Schaub, P. (2007). Designing products in multi-cultural teams in the context of education. *Proceedings of the International Conference on Engineering and Product Design Education*, pp. 601-606, Newcastle Upon Tyne, UK. [see no. 1 in Figure 3.3]
van Boeijen, A.G.C., Stappers, P.J. (2012) Designers coping with culture in an educational setting. *Proceedings of Design Research Society* 2012, 1-5 July 2012, Bangkok, Thailand. [see no. 8 in Figure 3.3]

Assignments – Assignments included a public transport device for Kowloon district, a design for 'hospitality', and two times a design for 'supporting the aging' in China.
Approach (project) – Each i.do workshop started with a one-week excursion to Mainland China to gain insights concerning local production, intended users, and user context. Local tutors and those from the participating students' countries supported i.do by lecturing and coaching. At the end of each week, the students – who were free to choose and develop their own design process – were asked to present their intermediate results.
Deliverables – The final results comprised concept designs of physical products and services, captured in three-dimensional prototypes, mock-ups, posters, reports, three-minute video clips, and visual presentation materials.

Year	Projects	Weeks	HK	NL	G	K	USA	S	Report
2005	4	4	4	4	–	4	4	4	i.do 2005
2008	4	6	8	8	–	–	–	–	i.do 2008
2009	4	6	8	4	4	–	–	–	i.do 2009
2010	4	6	8	4	4	–	1	–	–
			28	20	8	4	5	4	69 students
			7	5	2	1	2	1	18 group interviews
			18	12	8	4	5	4	51 questionnaires

Table 3.1 Overview of i.do workshops studied: number of students grouped by year, by duration of attendance, and by country/region (HK=Hong Kong-China; NL=Netherlands; G=Germany; K=South Korea; USA= United States of America; S=Sweden)

Figure 3.5 Impression of an interview with i.do students from South Korea [case 1.1]

Research approach

Data – As can be seen in the overview in Figure 3.6 and Table 3.1, data from these cases were collected in the form of questionnaires and interviews.

- **Questionnaires** – In the second-last week of each workshop, the design students attended a one-hour lecture on the concept of culture. The aim of this was to sensitise them, with a view to helping them become aware of the need to handle culture-related issues in a sympathetic manner. This lecture was planned in the second part of the workshop to let students first experience and deal with cultural issues freely, without guidance. Immediately after the lecture, the students were asked to fill in Hofstede's questionnaire on dimensions to define their cultural profiles and to compare the results with the average profiles of their own country of origin as well as with the profiles of fellow students from other countries. Filling in the questionnaire served as a means to sensitise students prior to the interviews. The outcomes were used to understand to what extent design students from the different countries shared – or did not share – cultural values, in order to determine whether barriers – mentioned in interviews – that students experienced could be explained by these differences in the values (see Section 3.3).
- **Group interviews** – In the last week of the workshop, each group of students from the same school and country was interviewed, with a total of 69 students taking part in 18 video-taped interviews. The one-hour, semi-structured interviews were informal group discussions, guided to address six topics. The interviews began with (1) a general invitation to talk about early 'expectations' regarding the i.do workshop, and 'surprises' during the workshop; (2) the students were then asked about their teamwork, and (3) about the design methods they used, along with the design process. They were subsequently asked to discuss (4) the activities they had undertaken to understand their intended users, and (5) to reflect on the outcomes, the design results. The interviews ended with the students' opinions about (6) the final aim and the personal benefits gained from the i.do workshop. They were asked explicitly about the barriers they had experienced, as well as any opportunities and solutions they had encountered during the workshop. In addition, they were asked to illustrate their answers with examples and anecdotes.

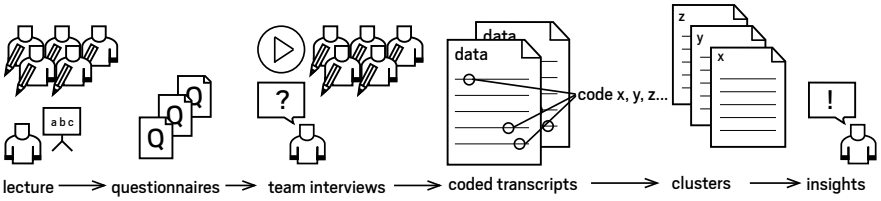


Figure 3.6 Overview of research activities in the i.do study

Analyses – On the basis of the questionnaire results, cultural profiles were constructed for each group of students from the same country. These profiles were compared with cultural profiles of the students' country of origin (Hofstede, 1997) along with profiles of their fellow students from other countries.
In stage A, the i.do 2005 workshop was studied and the results were published (van Boeijen and Badke-Schaub, 2007), see Figure 3.2 [1]. The analysis focused mainly on barriers in teamwork and on how they could be explained in terms of Hofstede's cultural dimensions. At a later time in stage A, all 18 transcribed interviews were analysed, which resulted in 364 quotes that were interpreted, coded, and clustered. The 364 quotes were divided into six main clusters, and each cluster was divided into quotes involving barriers and solutions, and into those quotes that did not fit into either category. Some quotes were used multiple times, clustered into two clusters. An overview of the six main clusters, with an example of a quote for each cluster, is presented in Table 3.2. Results from each cluster were analysed, and intermediate findings were published (van Boeijen and Stappers, 2012), see Figure 3.2, number [8].

cluster 1	cluster 2		cluster 3	cluster 4	cluster 5	cluster 6
expectations & surprises	i.do opportunities		teamwork 	process 	intended users 	design 
41	75	quotes	151	55	23	43
'It is not only him but in the train you see everybody is asleep (ha ha). ...once we saw a woman in the shopping mall and she was just reading a note or something and then she was like this and she was sleeping (ha ha), in the middle of the shopping mall.'	'One of the biggest side-effects of the project is that you really have to define who you are and where you are coming from and the way you work, and also have to be open for other's input, methods and ways to run the project.'	barriers	'I constantly have to ask them "what do you think", because I need to know what they think.'	'She did not like the brainstorm session because of the non-realistic and abstract ideas.'	'Each of us sketched the day of a Chinese couple and the HK students laughed ... it was not like that.'	'If I would have done it all by myself the design would have looked different.'
		solutions	'We brought a little basketball in the studio ... to relax and make yourself comfortable to stay open.'	'You expect that your methods will be the best to use, but then others have methods too, you have to compromise...'	'When I think about elderly I more relate them to my own grandparents ... would they like this or that...'	'Asian people have a different perception about hospiatlity, but we just chose some common features...'
		uncategorized	'I was immediately seen as the serious kind of workaholic, which was really surprising.'	'They have really nice methods to organize the data and information...'	'I think that there is much more respect for elderly here although that is changing...'	'We want to apply some Chinese style ... so the design is influenced by the modern and traditional style.'

Table 3.2 Overview of clustered quotes in stage A, illustrated with quote examples

In stage B, the quotes, together with data from the other case sets, were clustered anew and, together with insights from the other case sets, were developed into three categories of findings, which are presented in Sections 3.3 to 3.5.

3.2.2 Case set 2 – Joint Master Project cases (JMP-BoP)[9]

The second category of cases is formed by the Joint Master Project (JMP), a 2nd year course for students from three IDE design masters (Strategic Product Design, Design for Interaction, and Integrated Product Design) of the faculty of Industrial Design Engineering.

Setting – In a JMP course, design students from the three IDE design masters (IPD, DfI, SPD) formed teams with four to six team members. They worked for five to six months on a product innovation project in practice, mostly in small and medium-sized enterprises in the Netherlands. Several teams worked specifically on BoP projects in non-Western nations.

Assignments – The clients were Dutch or local companies and/or NGOs, and most of the project assignments addressed a specific local need: for example, a solar lamp for people who did not have access to the electricity grid, and a mobile medical diagnostic device to support health care workers in rural villages that were difficult to access. As well as a business plan, assignments included the development of a product design and its service system.

Approach (project) – An overview of the typical phases, locations, and results involving a JMP-BoP project is presented in Figure 3.7. The first phase was determined by research and analyses, and by the development of a design vision or design goal. The research took place partly in the Netherlands and partly in the local context of the intended users. The second phase centred on conceptualisation: developing ideas and concepts for both the product and a business plan. This phase was conducted in the local context of the intended users, while the materialisation phase was usually conducted in the Netherlands.

Deliverables – A report per case that included a description of the design process, the intermediate results, and the final results (product design and business model), along with prototypes, video clips, presentation slides, personal reflections, and an executive summary of the project.

[9] van Boeijen, A.G.C., Stappers P.J. (2011a) Preparing Western designers for the use of Context-mapping techniques in non-Western situations. *Proceedings of the Engineering and Product Design Education Conference*, 8-9 September 2011, London, UK. [see no. 6 in Figure 3.3]

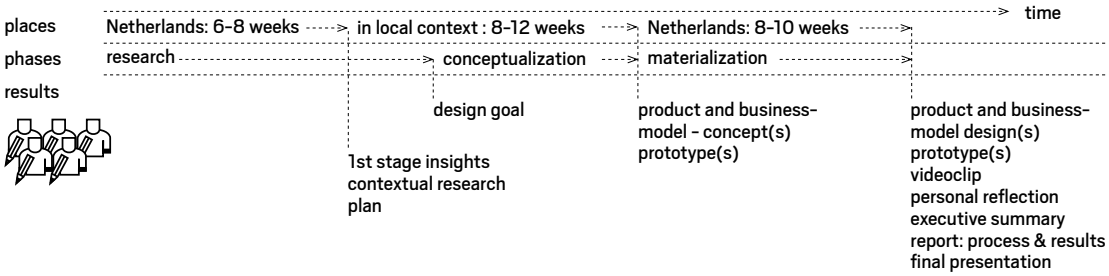


Figure 3.7 Overview of typical locations, phases, and results involving a JMP-BoP project

1 – Mobile academy [case 2.4]
Accessible education for entrepreneurs living in rural villages in Kenya.
Designed by Henriette Bunk et al. (2010)

2 – Hebi base [case 2.2]
Revised design of a baby incubator for use in rural hospitals in Kenya; an affordable, reliable, and acceptable solution.
Designed by Lin Dinh et al. (2009)

3 – Feminine hygiene [case 2.5]
Affordable and acceptable sanitary pads for women living in townships in South Africa.
Designed by Suzanne Gehem et al. (2010)

Figure 3.8 Three examples of JMP-BoP projects

Research approach

As shown in the overview in Figure 3.4, data from these cases were collected in different ways and from various sources:

- four projects were studied intensively by way of coaching, a report analysis, a short questionnaire, and team interviews;
- two projects were studied by way of a report analysis, questionnaires, and interviews with one of the team members;
- two projects were studied by way of a report analysis, one completed questionnaire, and a reflection document;
- six projects were studied by way of coaching and a report analysis;
- one project was studied by way of a report analysis only.

Coaching – In 10 of the 15 projects, I was involved as a coach, a supervisor, and an assessor.

Data – As shown in the overview in Figure 3.9 data was collected in the form of reports, questionnaires and interviews.

- **Reports** – Student reports were important sources of information to determine how team members examined and applied culture-related insights.
- **Questionnaires and interviews** – The aim of the interviews was to ensure that, as in the i.do workshops, students shared information regarding barriers, solutions, and opportunities, accompanied by anecdotes about unexpected and surprising events that, in their opinion, arose from cultural differences. These stories contributed to insights into what biases and other barriers the designers encountered, and how they dealt with them. In the first four projects, interviews were preceded by a short questionnaire (see Appendix 5) to sensitise students, and asking them about their reasons for taking part in a BoP project. Each interview, which was semi-structured, took one-and-a-half hours, and addressed the following topics: personal motivations for participating in a BoP project (sensitising question), time and planning of the project, applied design methods, surprises and unexpected events, design activities that succeeded or failed, preparation issues, and cultural differences experienced.
  The other questionnaires (see Appendix 6), which were completed by three students from three different projects, focused on methods used to understand the culture of intended users; these included methods, procedures, biases, what succeeded and what failed, expectations, and surprises. Two of the completed questionnaires were discussed individually in two one-hour interviews.

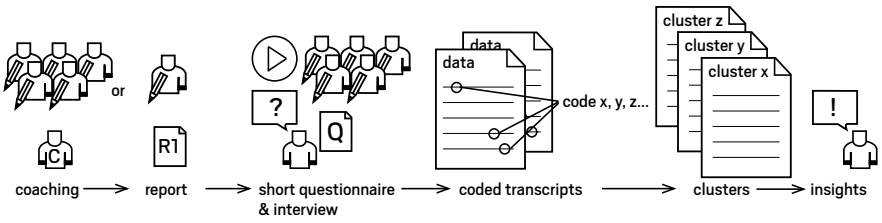


Figure 3.9 Overview of research activities in a selection of JMP-BoP and JMP-GP studies, stage A

Analyses – Data from the, in total, six interviews were recorded, transcribed, coded, clustered, and interpreted; see Figure 3.9 for a visualisation of the research activities. Together with the reports and with feedback during coaching, and in combination with insights from GP-BoP projects and C&C essays, intermediate findings were published (van Boeijen and Stappers, 2011). In stage A of the data analyses, the assessment focused on barriers that designers encountered in participatory sessions. In stage B, the data were clustered anew, and, together with insights from the other case sets, were developed into the previously mentioned three categories of findings.

3.2.3 Case set 3 – Graduation Projects cases (GP-BoP)[10]

The third category of cases shows similarities to the JMP-BoP, although the students worked individually.

Setting – In the 2nd semester of the 2nd year, IDE master students worked approximately six months individually on their final graduation project.

Assignments – The assignments were similar to those in the JMP-BoP projects. Figure 3.10 shows three examples.

Approach (project) – The general approach was similar to that of the JMP-BoP projects. There was also a phase during which the design students went abroad to study the local context. In one GP-BoP (case 3-11), the student was not able to visit the local context due to political conflicts that make the area unsafe.

Deliverables – This was a MSc thesis, a report that included a description of the design process, the intermediate results, and the final results (product design), along with simulation models, video clips, and presentation slides.

[10] van Boeijen, A.G.C. (2007) *Hoe worden gehandicapte kinderen in Ethiopie zelfredzaam?* Article in O2 Magazine. [see no. 2 in Figure 3.3]
van Boeijen, A.G.C., Stappers P.J. (2008). How can designers better incorporate cultural aspects in their designs for the Base of the Pyramid (BoP); and why should they? *Proceedings of DesignEd Asia Conference*, Hong Kong, China. [see no. 3 in Figure 3.3]
Arik, D., van Boeijen A.G.C., Kandachar P.V. (2009) Persuasion for a Healthier Life: Persuasive Technology Design Guidelines from the Precious Project for Indian Diabetics. *Proceedings of the International Association of Societies of Design Research Conference*, Seoul, South Korea. [see no. 4 in Figure 3.3]
van Boeijen, A.G.C., Stappers P.J. (2011a) Preparing Western designers for the use of Context-mapping techniques in non-Western situations. *Proceedings of the Engineering and Product Design Education Conference*, 8-9 September 2011, London, UK. [see no. 6 in Figure 3.3]
van Boeijen, A.G.C., Stappers, P.J. (2011b) Serving the under-served: What can designers learn from Rural Appraisal Techniques? *Proceedings of the International Association of Societies of Design Research Conference*, 31 October – 04 November 2011, Delft. [see no. 7 in Figure 3.3]

1 – Better Brace Project [case 3.7]

A lightweight and locally produced brace for disabled children in Ethiopia.

Designed by Koos Munneke (2007)

2 – Solar Refrigerator [case 3.12]

A low-cost new technology for refrigeration, applied in two different contexts of use: in rural Suriname (BoP) and on leisure boats in the Netherlands (ToP).
Designed by Jonas Martens (2010)

3 – Feminine hygiene [case 2.14]

An educative programme about menstrual symptoms, including a sanitary napkin for rural Indian women.

Designed by Guglia Bazoli (2011)

Figure 3.10 Three examples of GP-BoP projects

Research approach

As can be seen in the overview in Figure 3.4, data from these cases were, as in the JMP-BoP cases, collected in different ways and from various sources:

- two projects were studied intensively by way of coaching, a report analysis, a short questionnaire, and an interview;
- one project was studied by way of coaching, a report analysis, and an interview;
- one project was studied by way of a report analysis and an interview;
- six projects were studied by way of coaching and a report analysis;
- five projects were studied by way of a report analysis.

Coaching – In 9 of the 15 projects, I was involved as a coach.

Data collection –

- **Reports** – As with the JMP-BoP projects.
- **Questionnaire and interviews** – As with the JMP-BoP projects, data from the 15 cases were gathered and analysed. Interviews for the first two projects were preceded by a very short questionnaire (see Appendix 5) to sensitise students to the notion of culture, asking them about their reasons for participating in a BoP project. The interviews, which were semi-structured, took one-and-a-half hours, and addressed the topics as mentioned in the JMP-BoP cases. The other two interviews were conducted immediately after the students had completed their projects. All interviews were semi-structured and not recorded. Notes were made during the project and during and after interviewing.

Analyses – As with the JMP-BoP cases, data from the two interviews were recorded, transcribed, coded and clustered, and interpreted; see Figure 3.9 for a visualisation of the research activities. The other two interviews were not accompanied by a questionnaire and were not recorded. These interviews lasted for one hour, and notes were made. Analysis results (reasons for overlooking the notion of culture) of case 3.7 were published (van Boeijen, 2007a). Together with other cases, a second analysis was conducted, and resulted in the detection of more cultural barriers that designers encounter in BoP projects, and the reasons for disregarding culture. These results were published (van Boeijen and Stappers, 2008).
The above was in stage A of the data analyses. In stage B, the data were clustered anew, and, together with insights gained from the other case sets, were developed into the previously mentioned three categories of findings.

1 – Rest cabin [case 4.3]

Members of aircraft crews on long-distance flights are obliged to rest for a few hours in a cabin designed for that purpose. A rest cabin is a compartment with about eight beds. Crews from various countries use the same product.
Designed by Frens Pries (2011)

2 – Chinese passengers–Dutch crew interaction [case 4.5]

Several means were designed to improve communication between the Dutch aircraft crew and Chinese passengers.

Designed by Le Li (2013)

3 – Wood stove [case 4-1]

A wood stove, developed initially for a BoP context, was redesigned for a European camping context (ToP).

Designed by Christine Zeijlstra (2006)

Figure 3.11 Three examples of GP projects

3.2.4 Case set 4 – Graduation projects (GP)[11]

Five extra non-BoP graduation projects were selected on the basis of their international character and the cultural models that were applied. They form the fourth category of cases.

Setting – In the 2nd semester of the 2nd year, master students worked approximately six months individually on their graduation project.

Assignments – Five projects were conducted, three of which were for companies, one was for a foundation, and one was an internal research project. Three examples are presented in Figure 3.11.

Approach (project) – Except for the research project, the design phases were similar to those in the GP-BoP projects. For the flight attendants' rest cabin project [case 4.3], research was carried out with the help of 'remote co-researchers'. These were frequent flyers who helped designers to gain insights regarding difficult-to-reach intended users (flight attendants). This approach was published (Pries et al., 2012). In the project involving interaction between Chinese passengers and a Dutch crew [case 4.5], the design student himself flew with intended users in order to reach them.

Deliverables – This was MSc thesis, a report that included a description of the design process, the intermediate results, and the final results (product design), along with simulation models and presentation slides.

Research approach

All data from the five projects were gathered by way of coaching and report analyses.

Coaching – In all projects, I was involved as a coach.

Data collection – Similar to the JMP-BoP and GP-BoP projects, data was based on reports. No questionnaires or interviews were used.

Analyses – In stage A, two projects were studied individually, and led to insights that were published in two publications. One analysis focused on the possibilities of using Hofstede's cultural model to generate ideas, while he other examined the barriers to understanding global users.

In stage B, the reports were analysed anew, and, together with insights from the other cases, were developed into the three categories of findings.

[11] Akil, M., van Boeijen A.G.C., Boess, S. (2009) Sharing migrant stories: inclusion through facilitation of storytelling. *Proceedings of Include 2009 Conference*, London. [see no. 5 in Figure 3.3]
Pries, J.F.F., van Boeijen A.G.C., van der Lugt, R. (2012) Deep inside friendly territory: Involving remote co-researchers to understand global users. *Proceedings of ServDes 2012 Conference*, 8-10 February 2012, Helsinki, Finland. [see no. 9 in Figure 3.3]

3.2.5 Case set 5 – Context & Conceptualisation essays (C&C essays)[12]

Written by first- and second-semester students in the IDE master Design for Interaction, the essays form the last set.

Setting – Within the 1st year master course Context & Conceptualization (for the masters Design for Interaction and Strategic Product Design), students were asked to write an essay about a specific design topic.

Assignments – Students selected a topic from a list. Two assignments were formulated for the research in this thesis: Reflection on Contextmapping techniques applied in BoP projects [A1] and Comparison of Contextmapping with Rapid Rural Appraisal (RRA) and Participative Rural Appraisal (PRA) [A2]. As we have seen, results from the second assignment were used in the literature study presented in Chapter 2.

Approach (assignment) – The assignments started with a one-hour lecture given by the author of this thesis. With the first-stage framework, design students were sensitised regarding culture. The sources they used were derived mainly from the literature and from their own experiences with BoP projects.

Deliverable – This was an essay, a short paper structured according to the guidelines used for a scientific paper (i.e. title-abstract-keywords-introduction-literature review-research approach-results-discussion-conclusions-references).

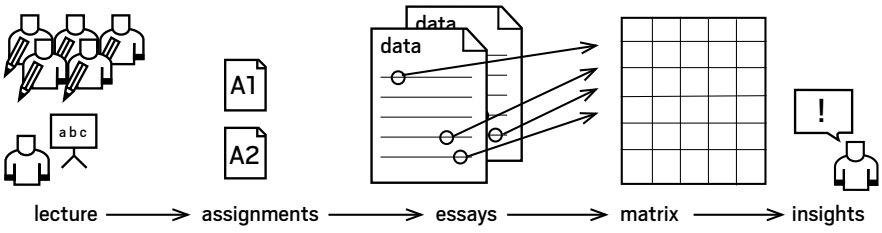


Figure 3.12 Overview of research activities in the C&C essays

[12] van Boeijen, A.G.C., Stappers, P.J. (2011a) Preparing Western designers for the use of Contextmapping techniques in non-Western situations. *Proceedings of the Engineering and Product Design Education Conference*, 8-9 September 2011, London, UK. [see no. 6 in Figure 3.3]
van Boeijen, A.G.C., Stappers, P.J. (2011b) Serving the under-served: *What can designers learn from Rural Appraisal Techniques? Proceedings of the International Association of Societies of Design Research Conference*, 31 October – 04 November 2011, Delft. [see no. 7 in Figure 3.3]

Research approach

Data collection – The first assignment resulted in 17 essays that were based mainly on the students' personal experiences of using Contextmapping techniques in BoP projects. The second assignment resulted in 14 essays that were based mainly on a study of the literature, and were therefore already used for the literature study in Chapter 2 (see Section 2.2.2).

Analyses – Data regarding the first assignment were processed in a matrix divided into the phases of Contextmapping: these were preparation, sensitising, make&say, discussion, analyses, capture&share, and an extra cluster involving problems and guidelines for the BoP context (see Table 3.3). Together with insights from JMP-BoP and GP-BoP, the first guidelines for the tuning of Contextmapping techniques to non-Western situations were developed (van Boeijen and Stappers, 2011a).

	stages of a contextmapping session						
essay nr. & nation	prepare	sensitize	make & say	discuss	analyze	capture & share	barriers & guidelines
essay 1							
essay 2			findings				
essay 3							
etcetera...							
essay 17							

Table 3.3 Insights from the 17 essays were clustered according to this table, stage A

In stage B, the data were clustered anew, and, together with insights from the other case sets, were developed into the previously mentioned three categories of findings.

Results and discussion – Three categories of findings (Section 3.3, 3.4, 3.5, and 3.6)

As mentioned earlier there was a stage A and a stage B of analyses of the data. Stage A resulted in the nine publications referred to and stage B is discussed here. The reasons for the different steps of analyses are found in the respective goals. For stage A the goal was, more than in stage B, focussed on understanding barriers that designers encounter and opportunities for culture-conscious design. For stage B the goal was to develop the framework and a tool. For the development of the tool it was necessary to know (1) designers' reasons for studying the culture (why?); (2) what they already do to understand culture (what?), and (3) the methods and tools they use to understand the culture of their intended users (how?) (see Figure 3.13). The cases studied helped in understanding designers' needs.
Results were brought together in three categories of findings, and are presented and discussed below in Sections 3.3 to 3.5. The categories are:
Category 1 – Designers' reasons for studying the culture of their intended users (Section 3.3);
Category 2 – Lens used by designers to determine their own cultural values and to delineate the cultural group (Section 3.4);
Category 3 – Designers' need to tune research methods to the culture of their intended users (Section 3.5).

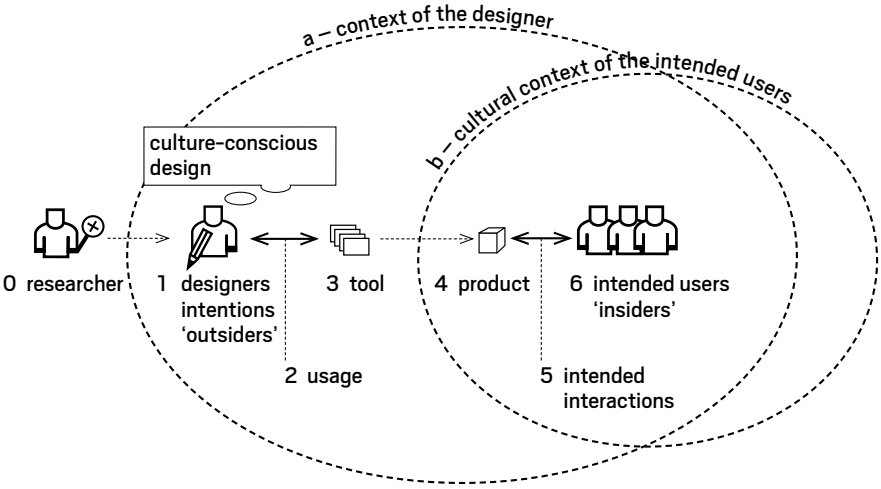


Figure 3.13 Overview of the main research elements in this thesis (see Figure 1.12) and the questions to be answered

3.3 Designers' reasons for studying the culture of intended users

This section discusses the reasons that designers had to study the culture of their intended users.
The designers' main reason for studying a culture was to increase the chances that their designs would be accepted and used as intended. Their intention was basically to avoid mismatches.

3.3.1 Matching the design with intended users

> 'A set of overalls (work-wear for the sanitation workers) was impossible, because it is for another profession; a work jacket was okay.' [case 2.3] (see Figure 3.15)

In the cases studied, three different categories of aspects were found to which the designers paid attention in order to increase the acceptability of their designs. These will be successively discussed below.

Matching forms and properties
Design students considered carefully the appropriate forms and properties (basic form, colour, material and texture, etc.). For example, for the design of an insect-repellent lamp in India [case 3.10], the archetype (the basic form of a product that represents a product category) was studied. The design student checked by showing pictures to the intended users, to determine in what product category they would place the basic form. The new design form was finally based on an existing local archetype for mobile lamps. The colour of the light chosen for the same lamp was white, which was also in accordance with local preferences.

Another design student also had the intention of making a connection with his intended users. He designed a solar lamp for rural Cambodia (Figure 3.14 [case 3.1]) (Boom et al., 2008), basing his preliminary form of the lamp on Angkor, a famous Cambodian temple. How his intended users perceived this is not clear. He did not study how this new form would be recognised or categorised by its intended users. Similar to this idea of linking the form of the design to a national symbol, another design student used the national colours of Cambodia in his design for a solar home lighting system [case 3.8].

Students in i.do workshops reported difficulties understanding what meaning the chosen product properties, such as colours, sizes, materials, patterns, materials, and textures, would have for their intended users. Not only the foreign design students but also the Hong Kong students felt uncertain. An American student

Angkor light
Designed by Stephen Boom

Angkor temple

Figure 3.14 Solar lighting system for rural Cambodia [case 3.1] (Boom et al. 2008)

commented: *'Moving blocks can be perceived as having been moved by ghosts. It took me a while to accept that'* [case 1.4, quote 85]. The blocks in question were part of a concept designed to help elderly Chinese people remain in contact with family members who lived some distance away. The blocks comprised about six magnetic elements, approximately 16 cm square, with a short text message written on each of them, such as 'How are you today?', 'Have you remembered to take your tablets?', 'I'm thinking of you right now', and so on. The magnets were positioned on the refrigerator, where the messages could be easily seen. By means of an electronic device, family members – from anywhere in the world – could select and move the blocks, according to which message they most wanted to convey at any given time. For the student, however, it was hard to imagine that these blocks, which seemed to move without the manipulation of a human being, could be frightening to an elderly Chinese person, to whom the notion of ghosts might be very real. Another example involved a Turkish design student involved in a project in India. He was inspired by 'rangoli', a form of art decoration often featured on the outside entrance to people's houses, and which he wanted to apply in his design. To his surprise, the result was not valued highly by the intended users, as the decoration did not evoke the same meaning and cultural values [case 3-9].

The difficulty here concerns how much the forms and properties can deviate from what people know and are already familiar with. This is the principle of Raymond Loewy, who maintains that products need to be Most Advanced Yet Acceptable (MAYA) (Loewy, 1951). Our tool for culture-conscious design could help designers: firstly, by making them aware that they need to learn about the existing frame of reference of their intended users (the archetypes that they know, the meaning of things in relation to forms and properties), and secondly, by providing them with suggestions to verify the acceptability of the forms and properties of their design, such as by the use of preference booklets (described later in Section 3.5.2).

Matching functions
Other concerns about matching a design with the requirements of intended users were related to culture-specific functions, in relation to how users could apply products (mode of use). Some illustrations:
A dishwasher did not match with the functional needs of Chinese users, as it was designed to clean plates rather than the bowls that Chinese people use [case 3.10].
In an i.do workshop design project [cases 1.1], a vending vehicle was developed, the basic function of which was the mobile selling of goods in the street. The design was adapted to the functions needed for specific contexts in several countries (Figure 3.16).

Matching basic functions with specific cultural groups did not seem to be difficult for the designers. Examples of the intended users assigning a completely different function to the product as intended by the designer – such as Umberto Eco's example of the toilet that was used to wash olives – were not found, largely because products in the cases studied had not yet been implemented. What intended users would finally do with the products and how this would enhance their cultural values could not be evaluated. Sub-functions might address the specific values of a culture: for example, an extra contact list in a mobile phone supports the collective use of mobile phones in India (see example in Section 1.1.1 and Figure 1.5). The tool could assist designers in thinking about this distinction in order to see new possibilities for their designs.

Matching product-user interactions
Another mismatch that design students tried to avoid had to do with product-user interactions.

One type of interaction to which they paid attention was based on routines: namely, interactions that do not have a specific meaning but are based on practical conventions. The manner of using the product is learned, and it is done unconsciously.
For example, the operation of an on-off button for a lamp was different than expected by the design student. She learned that people in India are accustomed to flipping a button up to turn a lamp on; in European countries, it is the other way around [case 3.10].
In a project involving a mobile health unit in Egypt [case 2.12], design students found that their intended users had a reading orientation that was different from their own. People in Arabic countries read from left to right, a finding that also had implications for the form and properties of the user interface.
During a project in The Gambia [case 2.15] involving a cooking stove, the designers consciously chose to stay very close to existing routines and cooking conventions in order to increase the match (according to Raymond Loewy's MAYA principle). In February 2014, the client reported that it was for this reason that the new energy-efficient design would be brought into production and become successful.

Another type of interaction, which is more relevant for our aim of culture-conscious design, was based on the meaning of the interactions, with reference to culture-specific values.
Cultural research in a sanitation BoP project for South Sudan reports a design guideline regarding gender: '*in a primary school, boys and girls should not be able to meet and not be out of sight of the supervisors when using the toilet*' [case 3.11]. The separation of gender roles was valued as very important.
Another BoP project focused on sanitation problems in a large slum in Kenya. The proposed solution was a biodegradable bag, to be used individually inside the house and collected by a service company. The faeces contained in the bags could subsequently be used as fertiliser for plants and vegetables in agricultural projects. The proposed use of bags was connected with a common habit in the slum of using plastic bags, and then throwing them out of the window [case 2.2] (see Figure 3.15). This habit is known as the 'flying toilet', and is perceived as a taboo; people are reluctant to admit that they practice it.
A Hong Kong student in an i.do workshop [case 1.4] reported that, in a design project aimed at the elderly in Hong Kong, students from Western countries found it difficult to understand that serving many dishes simultaneously to guests communicated and signified that they were welcome to select from the food. Carrying dishes one at a time, however, was valued as good, as opposed to creating efficient solutions such as carrying all the bowls at the same time.

In particular, the previous example – where Western students had difficulties recognising that cultural values could play a role in how product-user interactions are valued – highlights possible blind spots in this regard. By means of the examples, the culture-conscious design tool could help sensitive designers to potential issues.

3.3.2 Utilitarian and cultural values

The examples demonstrate that student designers are concerned about cultural aspects mainly for pragmatic reasons: namely, to create appropriate (intended) utility values for the intended users. For instance, the basic form of the insect-repellent lamp was determined to help intended users to easily recognise the function (mode of use) of the product. One can argue whether this is then a cultural aspect. Other examples indicate that the students also kept in mind the cultural meaning of their designs. Their concern was to connect to the values that their intended users shared. For example, the previously mentioned preliminary form of a solar lamp for use in rural Cambodia [case 3.1], based on the famous Angkor temple, was an attempt to connect to cultural values. Unfortunately, the design student did not evaluate this form beforehand. Another example was the sanitation service project [case 2.3], where the students were concerned with the cultural significance of the uniform worn by servants (see Figure 3.15).

The sanitation service devices

Designed by Sacha van Ginhoven, Marieke Korthals, Julie Louwman, Willem Lysen, Bastiaan Tolhuijs (2010)

The sanitation bag

Developed by Peepoople (2013)

Product service design for sanitation in a Kenyan slum

'People were convinced that metal was better than wood. The local people advised us to make the design not too sophisticated because then the product would be stolen.'

'A set of overalls (work-wear for the sanitation workers) was impossible, because it is for another profession; a work jacket was okay.'

Figure 3.15 Example of a desire to match a design with the needs of intended users [case 2.3]

Our aim in this research is to help designers, in particular by means of a lens to examine culture-specific values; we are less interested in helping them simply see differences that relate to local utilitarian values. However, the examples indicate that it is not easy for designers to make this distinction, because in their minds, the two value types are intertwined. The determination of the basic form of the insect-repellent lamp can be based on a utilitarian value (the function can be easily recognised) and at the same time on a cultural value (the form fits in a category of products that belong to a specific social group). The culture-conscious design tool could help designers make these distinctions by providing at each level in the reasoning process certain culture-specific questions and examples, along with methods and tools (see Section 3. 5.2) to elicit responses from intended users.

Conclusion

To the first question – What are designers' reasons for taking culture into account? – the answer is that it is basically to avoid mismatches. The intention is to solve problems and to make the right match so that the designs will be accepted and used as intended. In this regard, designers could be helped to better distinguish the different levels (form, properties, functions, needs, values) so that they might ask culture-specific questions. Methods and tools could also be provided to find answers, and to give examples as to how these answers are implemented in designs.

3.4 Lens used by designers to determine their own cultural values and to delineate the cultural group

The projects and workshops demonstrate the difficulties that designers experience in distinguishing cultural aspects related to personality and human nature. In the following sections the difficulties that designers have with culture will be discussed.

3.4.1 Designer's lens – What is culture specific and what not?

> 'Korean students do not say what they think. You constantly have to ask them "what do you think?".' [Swedish student, case 1.1, quote 352]
>
> 'We get a grade for everything. Swedish students do not; they only passed or did not pass. It was hard to understand that they did not get a grade.' [American student, case 1.1, quote 360]

The studies show the difficulty that designers have in separating personal, cultural, and human nature-related aspects. In the i.do workshops, Hofstede's dimensions were used to distinguish these cultural differences (see Section 3.2.1), and it was possible to explain the reported barriers in terms of those dimensions (element of the first-stage framework).

Examples of cultural barriers that were found included the following.
Some team members did not appreciate individual expression. One student expressed her irritation regarding a team member who did not use the word 'we' but 'I' when presenting their results. Other students complained about the small contributions made by their teammates, which they thought, was sometimes caused by personal and educational differences, and other times by cultural differences. In particular, Asian students expressed their need to learn to speak up and give a personal opinion. Western students mentioned that they had difficulties when team members did not share their thoughts.
Other behaviour that students perceived as a barrier included the dominant and competitive attitudes of some teammates who did not share their opinions. Another barrier mentioned was that team members handled time differently. Some complained about members coming late without giving prior notice, which in their opinion was impolite and very annoying. One student first tried to solve this problem by making indirect jokes about the other student's behaviour. Only through explicit discussion could new team norms be set in order to solve the problem.

The barriers could be explained in terms of the differences between design students' profiles. These were based on the results of the i.do questionnaires,

and illustrated to what extent design students from different nations shared common cultural values. The diagrammes in Figures 3.16 and 3.17 show clearly that the student profiles were quite similar, unlike the profiles of their respective countries/regions.

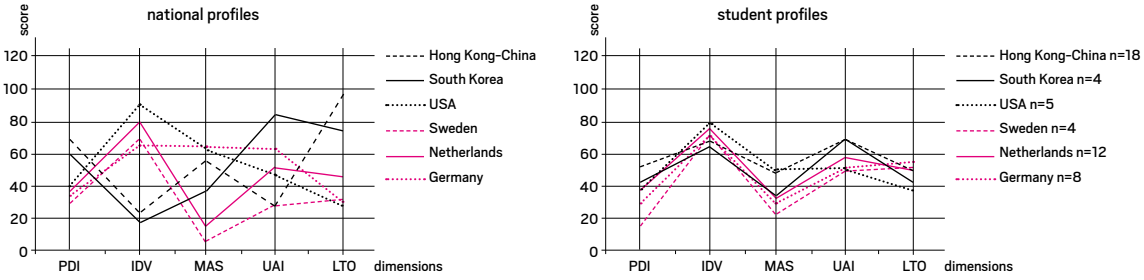


Figure 3.16 Cultural profiles: nations (left) and i.do students grouped by country (right)

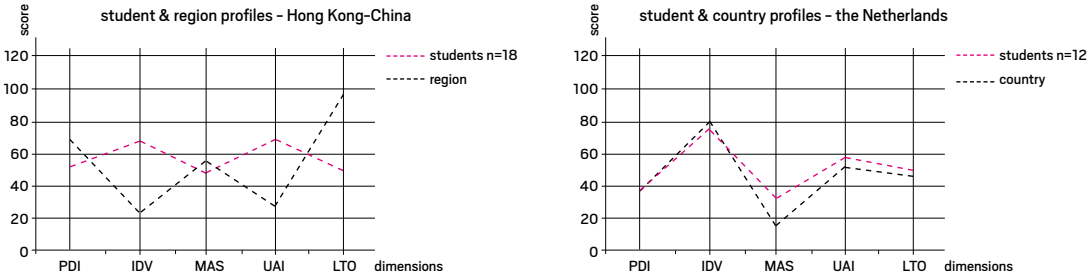


Figure 3.17 Cultural profiles: Hong Kong students and their region (left); Dutch students and their country (right)

For example, students from South Korea and Hong Kong scored high on the dimension 'individualism' (IDV), unlike their national profiles (scores are based on data from Hofstede, 2010). Apparently, their discipline made them part of a culture that stimulates individualism, and might attract people that value individualism highly. Nevertheless, the diagramme on the right shows that cultural values still differed between our students. Western students still scored a little higher than Asian students on, for example, 'individualism' (IDV) and higher on 'power distance' (PDI). Although lower than the average of their country, Asian students scored higher on 'power distance' (PDI) than did Western students, meaning that the Asian students were more accustomed to hierarchy within their social groups. All students scored lower on 'masculinity' (MAS) than the average of their country, meaning that they preferred to divide gender roles less strictly, and that achievement was valued lower than care in comparison with the national

average preference. The scores on this dimension also indicated there was no clear division between the traditional distinctions of cultures 'Western' and 'Asian'. All students scored relatively high on 'uncertainty avoidance' (UAI) and low on 'long-term pragmatism (LTP), compared with the scores in their country's profile. This could be because the students were relatively young, and had been asked for their opinions in an educational context. The fact that they were young and inexperienced might also have influenced their sensitivity regarding rules and short-term interests.

Although it is difficult indeed to separate individual and universal aspects as well as those typical for a group, the dimensions helped to explain the barriers that design students encountered. They were helpful in distinguishing cultural differences from differences in personality and from the principles that are based on human nature. Later in this thesis, we will see how designers might benefit from the dimensions.

3.4.2 The role of the designer's own cultural values

'One of the biggest side effects of the project is that you really have to define who you are, where you are coming from, and the way you work; and also you have to be open for other's input, methods, and way of running the project.' [Swedish student, case 1.1, quote 355]

'Up till now we were just designers; now we are international designers. You become aware of so much about yourself and other cultures.' [Dutch student, case 1.1, quote 339]

'They (team members) were very surprised about the different things in the living room. And they thought that it was very weird, but it was very normal. Some thought "why do you put the Buddha next to the items?" I explained what that meant, and they thought, like, "wow".' [Hong Kong student, case 1.4, quote 147]

From the cases, and particularly in the international workshops (i.do cases), it became clear that designers' own cultural values were revealed in the confrontation with the cultural values of other designers and intended users. It was only in realising the contrast that they became aware of their own cultural background. The cases also highlighted the difficulty designers experienced in overcoming cultural biases, which were revealed in the reported surprises – those events that the students did not expect (e.g. see quote 147 in case 1.4). Remarkable is that methods, tools, or other explicit activities that help designers to distinguish their own cultural and personal values, general values, or those related to their projects, were rarely found. Herein lies an excellent opportunity for design

educators to pay explicit attention to the designer's values, and this is discussed further in Chapter 6. Only in a JMP-BoP project with an international design team [case 2.12] did the team use the onion model (element of the framework) in a warming-up session, in which they shared values and practices with each other. The use of this framework element will be explored in further detail in Chapter 4.

3.4.3 Delineation of the cultural user group

'They (European team members) wanted to do something especially for elderly Chinese. That is really good. It is not globalised.' [Hong Kong student, case 1.4, quote 152]

'The labelling system itself is universal, but the category, how things are related … this is very close to the kitchen here, to the people.' [German student, case 1.4, quote 122]

'I cannot get rid of a universal approach to design … the function, the need is intercultural … we try to make it Chinese … the style is just the covering.' [German student, case 1.4, quote 123]

'Previously I thought it is a global design with those magnets, but now we are talking about recipes passing on from generation to generation. That sounds like Chinese for me, like in China we used to have a giant family tree from ancient times … difficult to see if it is global or Chinese.' [Hong Kong student, case 1.4, quote 154]

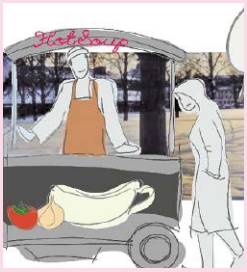
The cases illustrated that the design students encountered difficulties in determining the particular cultural group to be taken into account. It was not easy to set cultural boundaries, and was therefore difficult to select the intended users to be studied. Consequently, it was also hard to determine to what extent a design needed to be culture specific. For most BoP projects, it was somewhat easier than for other international projects, because the design assignments focused on the use of the product in rural areas where cultures were relatively homogeneous. However, there were also design assignments that sprouted from a local need but whose aim was to disseminate the solution globally. The following examples highlight different approaches to this local-global issue.
Designers of the 'anaemia diagnostic device' [case 2.14] were not sure how to approach such a project: namely, whether to begin a design based first on the local situation and then adapt it to a more global context, or to focus first on a global application, based on a generic image of what such a product should look like and how it should function. They chose to concentrate first on the local Indian context and users, developing a design goal for this local context. They subsequently developed concepts, selected one, and then evaluated the

design together with intended users in other nations, before adjusting the design where required.
In the 'solar bear' project (about a solar refrigerator) [case 3.12], the approach was more global from the outset. The technology developed for low-cost and sustainable cooling of food and medicines was applied to two contexts simultaneously, leading not to one global solution but to two designs modified to suit the target context: that is, one design for fishermen in rural Suriname, and one for party boats on the canals of Amsterdam (see Figure 3.10).
A wood stove, designed preliminarily for use in rural India, was redesigned for camping in a Western context [case 4.1] (see Figure 3.11). Just as in the 'solar bear' case, the main function remained the same, but for the Western context a grilling and barbeque function were added. The forms and properties were reasonably different.
In the i.do workshop interviews, some students discussed whether their designs were global or local solutions. They stated that the designs originated mostly from a local need, but the result was often considered to be a more global one, which meant that the designs did not refer typically to a specific culture. For example, inspiration for the design of the mobile vending vehicle (see Figure 3.18) had its origin in Hong Kong, where people use vending vehicles in the streets. Some students stated that their designs were basically universal, and that cultural aspects were reflected only in the design style. Apparently, it was difficult for them to see that the cultural meaning of a product was formed not only by its

Nomad vending vehicle

Souvenirs in Beijing

Tourist-info in Paris



Hot soup in Stockholm

Design students observed that in Hong Kong and Mainland China, people were selling food or other products in the street, using small and simple portable devices. These practices, together with the upcoming Olympics in Beijing and the different cultures of the team members, inspired design students to come up with a multi-purpose vending vehicle called 'Nomad'.

The vehicle was adjusted to three different local situations: selling souvenirs during the Olympics, providing tourist information in Paris, and selling soup in wintertime in Scandinavia.

Designed by Robin Melchior, Sein Park, Eric Yeung, Ulrika Henricson and Evan Wadsworth (I do 2005, pp. 34–44)

Figure 3.18 Example of a design that serves local and global needs [case 1.1]

visual appearance but also by its function, and consequently by the value(s) that it addressed.
In the rest cabin project [case 3.3], the goal was to design accommodation appropriate for airline crewmembers of various nationalities. The approach here was to first understand the needs and values of several crews from distinct countries. Cultural theories, from Trompenaars and Hampden-Turner (1998), Hall (1976), and Hofstede (2005), helped the designer to see which design aspects could be culture specific, and which were personal or based on general human principles. Hierarchy (specific bed for the crew captain) and gender (women changing clothes in the presence of men) were culture-sensitive aspects that the designer decided to take into account. He basically constructed his design goal on cultural values held by the KLM crew (low PDI, high IDV, and high IND) along with paying certain extra attention to gender roles, which were valued more highly in some of the other crew members' cultures.

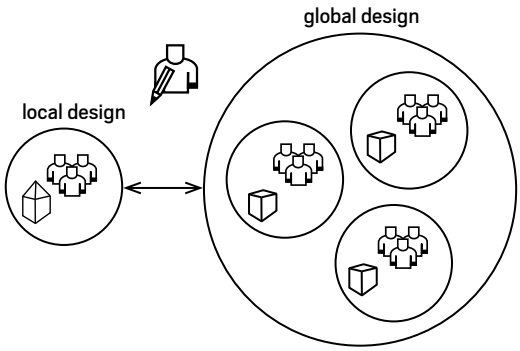


Figure 3.19 Going from local to global design and vice versa

The findings in this section can be broken down into three different possibilities for designers to approach the local-global issue:

1 Design first for a local cultural context, and then determine which aspects are not acceptable to other cultures (who are excluded). Then adjust the design in order to connect with intended users on a global scale;
2 Design simultaneously for two different cultural groups, both living in a completely different context. During the process it becomes clear what the designs will have in common and what will be specific to them;
3 Design for a global market from the start, focusing on the universal principles held by intended users and, if needed, adjusting the design to the local culture at a later stage.

3.4.4 Designers' focus, and understanding of culture, is influenced by team dynamics and project stakeholders' backgrounds

> 'I think it would be totally different (the design) … we had to explain again and again, and they just said "I like it", but if we were to make it in a Hong Kong team, we would make it totally different.' [Hong Kong student, case 1.3, quote 237]
>
> 'If we were in a Hong Kong team, we would have the name based on the product and maybe not on the language.' [Hong Kong student, case 1.3, quote 238]

In the international workshops, the extent to which culture was taken into account was influenced by the cultural differences among team members. They tended to compromise on each other's opinions, which appeared to lead to average designs without a culture- and context-specific meaning. Equal power in the team led to equal arguments and to the search for globally accepted solutions.

In addition, the stakeholders' backgrounds influenced how far the designers took culture into consideration. The interests and capabilities of the designers, the clients' interests, and those of other involved parties determined to what extent the designers evaluated the notion of culture.
In the windmill case [case 2.11], design team roles were clearly divided into business centred, human centred, and technology centred. The team member who was concentrating on technology could not be convinced easily regarding the relevance of paying special attention to the form of the windmill. The windmill's primary function was of most interest to him, and only at the end of the project did the socio-cultural value of the form become clear. The flag (see Figure 3.20) proposed by the human-centred designer appeared to be very successful. The farmers reacted enthusiastically, because with the personalised colour they could now demonstrate their ownership, not only of the windmill but also of their land. A simple flag appeared to be important for acceptance of the new design.

In the 'better brace' project [case 3.7], culture was disregarded because priority – both on the part of the designer and the clients – was given to the utilitarian values of the design, which was for a lightweight brace that could be produced locally. No thought was given to cultural values. Aspects such as the acceptability of the brace by, for example, family or village members were not studied.

Conclusion

To the second question – How do designers handle the concept of culture? – the answer is that they have difficulties distinguishing between cultural and personal values and values having to do with basic human nature. If we want to help designers take cultural aspects into consideration, we must first provide a lens to differentiate between what is and what is not culture related. This lens or framework could help designers become aware of their own inherent cultural values. During the course of the research, these values were revealed when designers' confronted those held by other designers. On the basis of understanding their own cultural values, designers could develop a personal stance, which would better equip them to distinguish the cultural values of their intended users, and to deal with influences based on cultural differences in the context of team dynamics. A finely adjusted lens could help designers delineate the cultural group for which they design. However, distinguishing culture and delineating the cultural group are not the only difficulties. Other factors – such as areas of interest and capabilities – compete with the notion of culture-conscious design, and designers could be made more aware of these influences. For example, in teamwork and with interested parties, they could embark on a project by exploring their own personal values and discussing possible cultural influences. A method could be developed to do this in a systematic way.

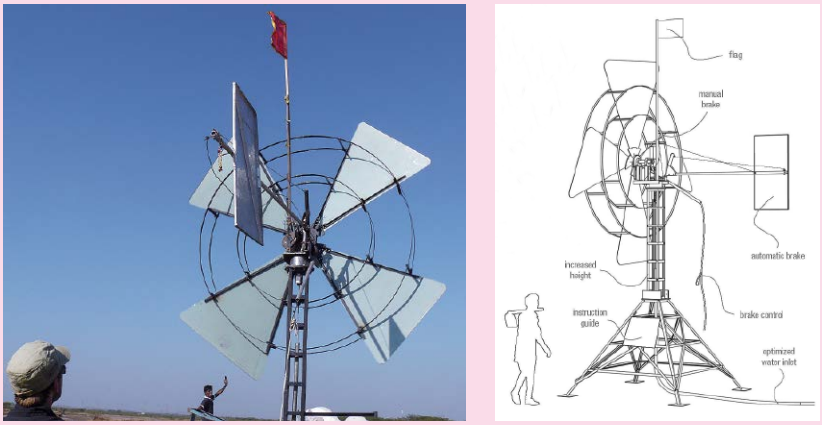


Figure 3.20 The flag on the redesigned windmill [case 2.11], designed by Casper van der Meer, Emma Haagen, Juan David Martin and Nick van der Velde (2012)

3.5 Designers' need to tune their research methods to the culture of intended users

This section will give answer on the third question 'What do designers do to understand the culture of their intended users?'. In order to determine how we can help designers understand the culture of their intended users, we identified the activities they had already undertaken, along with what barriers they had encountered and what solutions they had devised. A broad range of design-research methods were found, both non-participatory and participatory. These were tuned to the local culture, and some new tools were designed to fit the local context. These new tools are presented in Section 3.5.2 as dedicated design tools. Most findings were based on the JMP-BoP, JMP-GP cases, and C&C essays, but certain insights from i.do workshops came into play as well.

3.5.1 Participatory design methods

Design students applied various participatory methods, and conducted generative sessions with intended users, though a concern of the students was that they were not sure whether their participatory methods would be applicable in an unfamiliar culture. Six types of barriers were identified that needed extra attention in terms of participatory design research sessions, such as Contextmapping, in a project where cultural chasms needed to be crossed. Each type could be connected to three focal points: the selection of participants, the design of sessions and materials, and the role and attitude of the facilitator(s) (see Figure 3.21).

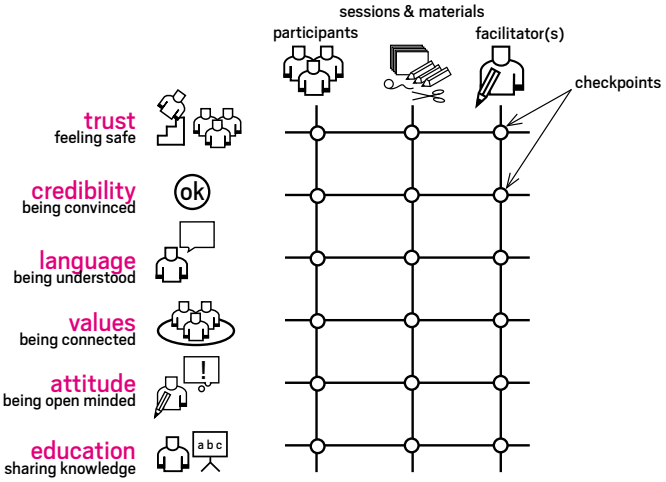


Figure 3.21 Overview regarding participatory sessions, and the six barriers and three focal points that need to be checked for tuning to the cultural context

Trust – Participants need to feel safe

> 'Trust is most important; you need to be there for a long time, and many times.' [case 2.3]

Design students reported in several cases that they needed to spend more time and effort than they were accustomed to, in order to build up a trustful relationship with their intended users. Intended users who participated in sessions sometimes did not feel comfortable, and therefore had difficulties expressing themselves.

In the i.do workshop interviews, students encountered difficulties due to the intended Chinese users not being able to express themselves sufficiently during interviews. In order to understand the needs and wishes of these intended users, the students wanted them to talk freely. A Hong Kong student explained that unclear reasons behind questions and short assignments such as drawings made participants feel insecure; they held back, especially if other participants could notice mistakes, even if they were close family, or even if the intended users usually liked to take part in an activity, such as drawing.

In several Contextmapping sessions, participants did not feel secure enough to share their feelings and opinions. In a session in Colombia, the participants, who were neighbours in a village, did not trust each other due to political conflicts. In an icebreaker session (a standard technique to enable people to get to know each other and to feel free), participants were asked to cut pictures from magazines and place them on the forehead of a fellow participant. Each person was asked to guess who (s)he was by asking questions alternately. This session turned out to be highly political, as pictures of cruel leaders were selected, which led to a tense atmosphere. Participants also did not feel confident enough to speak their minds when their position in a hierarchy (high PDI) was lower than that of other participants. Participants with no or low drawing skills sometimes did not feel comfortable in a drawing session. Uncertainty also led to an attitude of 'wanting to please' on the part of participants, who answered questions only to make the facilitator happy, and without sharing real thoughts and deep-seated wishes.

In projects in China and South Korea, communication was difficult when assignments were formulated in too open a manner: namely, leaving so many possibilities for answers increased the risk of giving wrong answers (high UAI) and of disturbing harmony (high LTP).

Credibility – Participants need to be convinced that their contribution is relevant and useful

> 'Some male Sudanese participants did not feel comfortable with the visual aid provided, because according to them, the visuals looked cartoonish, which gave them a less serious feeling. They said that serious things should look serious… One male also added, "I do not have time to play with toys".' [case 3.11, p.108]

Besides trust, another barrier was that some participants found the outcome of the sessions untrustworthy, and lacking credibility. Open and unstructured sessions were sometimes perceived as not having been prepared, which led to participants feeling disrespected by the facilitators. The participants did not see the relevance of the sessions, and were not motivated to contribute. Usually, Contextmapping sessions go beyond the main topic in order to avoid narrow views, and to dig deeper for underlying needs and values. Participants did not always understand that it was useful to fill in workbooks, and to speak about topics that were not directly linked to their immediate problems. Men sometimes considered the supporting material (for workbooks, and images for making collages) to be childish (high MAS). As a result, the session had little credibility, which led to unmotivated participants.
In a project regarding mobile care, the students were aware of the need to approach doctors formally to protect the credibility of their project; one student stated: '*While interviewing doctors, a more formal setting and time constraints create a less appropriate situation in which to use the introduction booklet*' [case 2.12, p.14]. Another student wrote: *'Doctors did not have much time, and a well-prepared appearance reassured them in terms of spending some time on an interview … a professional and formal outlook, which is good considering Egypt has a high PDI score … letting him read the questions helped him understand them better'* [case 2.12, p.11]. A project brochure and carefully designed interview cards helped raise the credibility of the students' research.

Language – Participants and designers need to overcome communication problems

> 'Learning their language and spending time with their families was really important.' [case 3.10]
>
> 'We spent a lot of time translating everything, but then we went to illiterate people, and the pictures worked well. For official documents such as brochures, text is very good, but for sessions visuals are better; …letting him read the questions helped him understand them better.' [case 2.12, p. 11]

Another barrier that arose was that facilitators often did not share a common language. They could not speak the local language, and therefore had difficulties communicating, especially with non-formal participants. In translations done by interpreters, information was often lost, long conversations were translated in just a few sentences, only facts were summarised, and no emotions or feelings on the part of the interviewees were conveyed. The answers were adjusted and interpreted according to the social situation (socially acceptable answers with biases).
In JMP-BoP projects, students commented: *'You miss nuance'* [case 2.2].
Visuals such as picture cards were helpful. *'I think it worked very well, because it is easy for them to pick, and it also reduces the translating time … we tried to make a device to reduce the amount of translation'* [case 2.12]. *'I initially thought the young guy would be much easier to communicate with, but I changed my mind and decided to go with the older guy. He knew how to talk to people, he added, modified questions to make the interview look like an informal chat'* [case 3.1].
Hong Kong students in the i.do workshops often served as interpreters, but did not always succeed in translating everything.
Visual materials helped in most cases, but sometimes could not be understood because (1) the participants were not familiar with the subject, (2) the visuals were too abstract for them to understand, and (3) the context of the visual was missing. These materials in a typical Western context would lead to valuable associative or metaphorical interpretations, but here they did not function that way.
A remarkable finding was the use of a 'Pointer booklet'. Developed for travellers to help bridge the language gap, this booklet did not work as intended. The design students used it to try to understand what sorts of things made the intended users proud, by showing them pictures and asking if they were familiar with the objects. The participants became offended, because everything that was shown was Western, and they did not have those products. '*"Of course we do not have that", they said, so we stopped using it. Using product pictures from the users' own environment worked well*' [case 2.8].

Values – Participants and designers need to tune their cultural values

> 'On the basis of my experience with this (Indian) family, I prepared a presentation with my goals and plans. This was not positively accepted. I was supposed to ask them what to do, their advice and directions.' [case 3.10, p.44]

Another barrier that caused difficulties during participatory sessions was the difference in cultural values between designers and participants. In some cases, discussed in the C&C essays, specific topics were taboo, especially with strangers and people of the opposite sex (high PDI and MAS).

For some cultures, for example in South Korea, expressing a personal opinion and making mistakes within a group was often valued negatively; the established opinion of a group in general was valued positively, and it was considered necessary to protect the harmony within the group (low IDV).
For a group session in China, a Chinese student reported problems regarding the expression of personal opinions; the participants preferred to show agreement rather than disagreement, in order to protect the harmony in the group (low IDV).
Also regarding the use of take-home workbooks, participants were afraid to make mistakes, and they asked for help from family members, which was a problem when individual information was needed (low IDV and high UAI).
In some instances, participants did not like ambiguous and unstructured situations, and preferred to be in control, having clear rules and facts, which was in keeping with their country's high score for the Uncertainty Avoidance (high UAI) dimension.
In some projects it was reported that women involved in participatory sessions were expected to remain quiet when men were present. Facilitators of participatory sessions in Kenya were surprised that women began chatting easily only after the men had left the session (high MAS). The designer sometimes used visual features from the intended users' culture that were not appropriate; the connotation was, for example, 'childish', and did not seem to be appropriate to use for communicating with male adults.
In an i.do workshop, a Hong Kong student had difficulties convincing her Western team members that their intended users in a participatory session would not appreciate in-depth questioning, and that they should focus first on general aspects in order to protect group harmony (high UAI).
Some designers mentioned difficulties adjusting to the cultural values of their local stakeholders.
For example, a design student did an informal presentation for doctors in India. '*On the basis of my experience with this (Indian) family, I prepared a presentation with my goals and plans. This was not positively accepted. I was supposed to ask the doctors what to do, their advice and directions*' [case 3.10, p.44]. The attitude of the design student did not match the expectations of the doctors who valued hierarchy highly; the Dutch design student had not addressed this aspect. She based her attitude on a single experience with an Indian family. She did not take into account possible differences due to the professional context.

Attitude – Participants and designers need to deal with biases

'People in a slum can look happy.' [case 2.3]

Some barriers were a result of biases, both on the part of participants and designers. Examples:

JMP-BoP project in Kenya: *'Smart people living in a slum became co-designers, even when they are non-formal educated'* [case 2.3]. The students reported that in their own country media that reported only about African problems biased them. Furthermore, *'A surprise was about 'pitiful African people'; If you speak with the people yourself, it is just very different, I think'* (Bunk et al. 2010, case 2.4); and in another BoP project in Kenya: *'We had a wrong image of problems in Africa; poor people seem to be quite happy, we only see the problems'* [case 2.2]; and *'How incredibly motivated people in Kenya were to join our sessions… It really worked out well'* [case 2.4].
A Turkish design student in India listed his surprises. For instance, he was taken aback by how irrational and religious people were. *'Even highly educated people believed in things that for me were impossible to believe.'* He was also surprised by the extent to which equal power was divided among people in the company (multinational). In addition, he perceived a lack of hierarchy in a high power distance culture (high PDI), which demonstrates that one cannot rely on national scores on cultural dimensions for a specific context. Furthermore, the student learned this about himself: *'I was surprised how quickly I got used to the environment and the people'* [case 3.9].

The visual features of the intended users' culture sometimes obsessed the designers. They concentrated too strongly on cultural differences, and commonalities were therefore underserved.
For example, a Turkish designer in India was inspired by *rangoli*, a form of decorative art featured on the outside entrances to people's houses. Surprisingly to him, however, when he applied the concept of rangoli in his design, his intended users did not value it highly.

Students also missed information occasionally, owing to their subjective observations. Likewise, the students in their role as facilitators often had blind spots as well, and so were not aware of their own biases and those of the participants in their sessions.
For example, in one of the case interviews, the interviewees mentioned that to their surprise, according to their Kenyan stakeholders, they had arrived late for an appointment. The Kenyans emphasised that the team had promised to visit them within two weeks and they did not. The students did not expect the Kenyans to be strict regarding an appointment, as they had heard that people in the African culture were not as strict in their sense of time as those in the Dutch culture. The BoP team had not been able to see things from the perspective of the Kenyans, and realise that their sense of the present would be valued differently; thus, this provoked an interaction other than expected on the basis of culture-related information.

Education – Designers need to tune their sessions and materials to the participants' educational backgrounds

> 'A circle drawn on a piece of paper was interpreted as a hole. They were not able to read maps. During a drawing session, they drew very detailed and small. Making things tangible is very important.' [case 2.3]

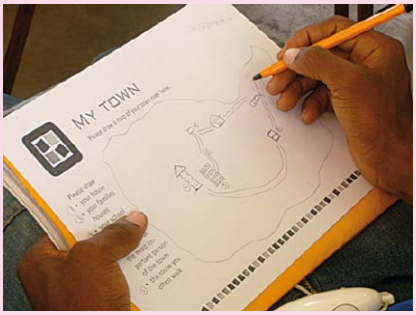
The last of the six barriers that design students encountered in participatory design sessions was the result of differences in education between designers and participants. In BoP projects, intended users that participated in participatory sessions often had little or vastly different education, and were often illiterate. Abstract drawings were frequently not understood, and detailed images were often understood quite literally (size, details, context*).*
For example, a student reported: *'I drew a house with a woman in front of it. The doctor said that people would take that literally: the doctor visiting her outside in front of her house. They are not used to abstraction. We always checked our tools'* [case 2.12]. The woman responded to the picture with the comment that the doctor usually did not stay outside the house. In a workbook, intended users were asked to draw their daily activities according to a time line, starting the day on the left side of the line and ending it on the right side. This linear way of representing a day was not always understood.
In another session, participants were asked to draw the people to whom they were closest. 'Closest' was meant emotionally, but was understood literally: namely, as referring to nearest neighbours.

Participants sometimes had difficulties with drawing, and felt uncomfortable. Ticking options in questionnaires and 'smileys' were also not fully understood [case 2.5]. Examples:
'A circle drawn on a piece of paper was interpreted as a hole. They were not able to read maps. During a drawing session they drew very detailed and small. Making things tangible is very important' [case 2.3]. In a design drawing, cross-sections of tubes were interpreted as tubes that had been cut into halves.
One design student commented that her intended users did not understand the product evaluation, since they were not used to surveys that asked consumers for their opinions.
Interesting is that during a participative session, one student's role of facilitator became that of teacher. It turned out to be a win-win situation, as he gained insights into the lives of his participants, and the participants learned about the topic he introduced. He stated: '*After a card session, which had the character of a game, participants wanted to continue. They wanted to know more about the oral diseases, sharing experiences and discomforts. They made notes and sketches about causes or risks explained and drawn on the blackboard by the designer'* [case 3.15].

All these examples in Section 3.5.1 illustrate the various barriers that designers might encounter in participatory sessions. In particular, barriers related to language and education are not necessarily seen as cultural in nature, but they are so intertwined with barriers caused by cultural differences that they are included in this overview. Designers could be supported by guidelines about how to tune their methods. Fortunately, designers are creative enough to design new methods and tools themselves, and the next section shows several examples of ones that were appropriated.

3.5.2 Dedicated design tools

In addition to barriers, solutions to deal with them were also found. Design students reported various tools that they used in participatory design sessions to understand the participants' cultural background. In Chapter 2, Figure 2.17 already shows an example. The paper *Preparing Western designers for the use of Contextmapping techniques in non-Western situations* (van Boeijen and Stappers, 2011) presents guidelines to tune Contextmapping to the cultural context.



'By filling in the booklets, the people knew that we were interested in their experiences. The anecdote of the visit to the Masaai village Kamakuru is a good example of this phenomenon: Before the visit, some young entrepreneurs were selected to join the session. When they were asked to introduce themselves, they all described themselves as "business ladies" and "businessman". After filling in the booklets, they could tell us they had a business in kettles, food, or furniture. Because the questions are not a matter of yes or no, but are asking them about their experiences, the participants could get the feeling that the interest was on an equal level. The playful style of the booklet made the participants open up. Because the booklet looked professional, it created trust in the researchers. The participants were assured that they were contributing to a serious project. The most information can be obtained if researcher and participant work closely together on the booklet. The researcher can use the assignments in the booklet to ask other questions, and gains even more empathy regarding the daily life of the participant. A drawback of this booklet is that it takes a long time to fill in. On one occasion, the researchers asked participants to complete the booklet in advance of the session, like homework, but people forgot about it, and did not bring their copy to the session.' [case 2.4]

Figure 3.22 Experiences with workbook sessions

1 – Sensitising booklets/workbooks

Sensitising booklets or workbooks are used to prepare intended users for a participatory session and to collect stories. If participants are not familiar with 'homework', the booklets can be used in a session. Abstract visualisations and symbols should be checked on intelligibility, and complete and precise examples such as timelines should be included. Design instructions refer preferably to what people already know.

Photo: case 2.4

2 – Preference booklets

The booklets facilitate a discussion that provides insights into a participant's preferences. The participant compares two visualised options and selects one; this is followed by a discussion. New options are presented, and again one is selected and discussed. This method is a concrete way of stimulating story telling and learning about the participant's frame of reference.

Photo: case 2.2

3 – Cards: family game

This card set can be used to manage topics in a design team, and to play with participants to elicit personal stories. Each participant needs to collect four cards relating to the same topic. If the participant requests and receives a specific sub-topic, in return (s)he then shares a personal story about it. In this way, the participant is in control of what (s)he wants to share. This makes people feel safe. The pictures support communication.

Photo: case 2.5

Figure 3.23 Three tools that support personal expression in Contextmapping sessions

Sensitising booklets or workbooks – Design students regularly questioned whether the sensitising booklets or workbooks (see Figure 3.22 and 3.23) would function as intended in a BoP context. It can be concluded from the cases that they do not work as take-home assignments, simply because most participants were not accustomed to the concept of homework. *'And when we arrived, everybody neatly brought the booklet, but they were all empty'* [case 2.4]. However, they were useful in sessions where the facilitators assisted participants, although it was clear that the visuals needed to be tuned (see Appendix 3).

Preference booklets – I introduced the 'preference booklets' (see Figure 3.23) to students in BoP projects, because it was reported that participants often had difficulties with open interviews. The booklets were used in various projects, and encouraged story telling that provided insights into participants' preferences for, for example, form, functions, colours, and user scenarios, as well as into the underlying reasons for their choices. The participants compared two visualised

options and selected one, and this was followed by a discussion. Two new options were presented, and again one was selected and discussed.
This method is a concrete way of stimulating discussion and learning about the participants' frame of reference and preferences. *'The preference tools were quick. They gave quick information; it was mainly the argumentation behind their choices where the information was obtained. It was interesting to use this tool on an individual basis, but small groups also worked well. Then the discussion had more voices'* [case 2.4].

Cards – These were also used. *'They contain images and words that help people to think about and tell stories of their life experiences, grounded in context and detail'* (Martin and Hanington, 2012, p.136). The pictures helped to overcome language and cultural barriers. *'…Not only did the content of the pictures help them* [the farmers] *to relate to different topics, but it also served as a heightener of engagement with the session. Farmers especially liked the fact that it was printed and in colour, and they were happy seeing pictures of other Indians, outside of their villages'* [case 2.13, p.46]. Various applications were identified, categorised by type, as in the following:

- **Cultural cards** were used to understand daily practices and their meaning and hierarchy of importance. For example, with cards (text and images) about family, house, water, nutrition, and money, priorities in daily life were discussed [case 3.15];
- **Topical cards** were used to understand participants' opinions about the topic related to the design project [case 3.15, p.44]. The card sets were used among team members, to manage topics that were relevant in the project, and not necessarily discussed to understand culture-specific aspects;
- **Family cards** were used as a family game (see Figure 3.23) to evoke stories, eliciting participants' personal experiences. Another way to use the topical card set was as interview cards to guide semi-structured interviews [case 3.13; case 2.12]. The cards helped designers to manage the interview and to raise the credibility of their project in the eyes of stakeholders.

Similar to Western methods, these few examples demonstrate the need to tune dedicated tools to local cultures. They also illustrate the creativity of some designers in designing and applying these tools. By providing examples along with guidelines on how to tune them, we could help designers by showing them how to create culture-conscious design tools.

3.5.3 Non-participatory design methods

In order to understand their intended users, students also applied traditional design methods. The resulting barriers and solutions are presented below.

Desktop research – Designers need to experience the local context

> 'Statistics are found easily, but what they mean for the individual lives of people is not clear.' [case 2.12]
>
> 'Once you are there, then you can use all your senses. Feeling textures, the humidity in the air, the smell, all these things make it a full image. The fact that you have walked there and have seen the hands of a woman or interacted with her, these things make it possible for me to empathise in the situation. When I arrived in India, it felt like everything became clear.' [case 3.10, p.45]

All design projects in this study began with desktop research (the literature and websites). Knowledge gained from desktop research was useful, but was too abstract and too far removed from the targeted context to apply in a design project. The designers, who were not familiar with the context for which they were designing, were uncertain about their own assumptions and about the meaning of information found in the literature. They reported that they could not rely on it. After exposure to the local context, they realised the necessity of learning from the local context by themselves; *'Only once you are in a room in India with 40 women, and it's hot and humid, and then the electricity fails, then you understand how your product should work and what it should be able to withstand. You can read about it, but only then can you understand'* [case 3.10, p.45]. Design students realised what it meant to have truly dark nights only after they had experienced them: *'You cannot imagine how dark it is; you take off your shoes and cannot find them again. Dark in the Netherlands is not really dark; we do not know that kind of darkness'* [case 2.8]. Many assumptions were based first on personal experience and desktop research findings. The designers then became uncertain as to whether these assumptions were true, and how relevant they were. For example, one designer did not expect intended users, living in a rural village in India, to place a value on the quality of a product [case 2.8]. Another design team, in a project that have been mentioned earlier, was surprised that despite the poverty of the intended users, who lived in a slum in Kenya, they looked happy [case 2.3]. Others were surprised about the importance of branding in a rural village in India, not expecting that a brand would be important, since it did not refer to a basic need [case 2.8]. The bias was that in poor areas, where basic needs were lacking, people would not care about brands, which appeared to be a wrong assumption. Another design team stated: *'Because it is a Muslim country (80%), we thought that people would be very closed, because we had*

heard these stories about the Middle East. The most closed one is Saudi Arabia, but the others are very open' [case 2.12]. Although most design students were aware of possible biases, and therefore set out with an open mind, they were still taken aback by several local practices.
The i.do workshop interviews also demonstrated that the stereotypes designers had in mind – and that were based partly on desktop research – did not always correspond to the real situation. *'Style-wise, I must say that in the first week I was expecting that Chinese people would really like flashy and neon-light kinds of designs … but it is not really so.'* [case 1.4, quote 72]
Experiences with the local situation of people seem to decrease some of the biases.

Observations – Designers tuned to the local context

> 'We tried not to be noticed, otherwise you would have all the village people around you.' [case 2.8]

One of the basic methods applied to understand the culture of intended users was to observe daily practices. Observations were included in all projects, and were regarded as necessary to understand the significance of desktop findings. In some cases, observations were done systematically and were reported; in other cases, they were not carried out systematically, and/or were intertwined with research methods regarding usage.
For instance, observations were conducted by means of guided tours through the living areas of intended users, during generative sessions, and as unannounced visits to people's houses: *'When you visit unannounced, you see so much more of the actual usage of the prototype. With one family, they had celebrated a birthday, and used one of the birthday hats on top of the lamp. In this way, the son wasn't looking straight into the light when studying. I would never have found that out if I hadn't visited them then'* [case 3.10, p.42]. Unannounced visits helped to avoid situations where people adjusted their behaviour too much, as the designers would not have gained reliable insights. These undesired adjustments were also prevented by hiding the designers' own identity.
Another design team reported: '*We tried not to be noticed, otherwise you would have village people all around you. One time we also went out at night, wearing headscarves so that nobody would see that we were blond. And then we just looked inside houses and visited people*' [case 2.8].
Observations were also made during generative sessions. In one of these regarding feminine hygiene, young women were asked to show how they usually used a sanitary napkin. The designers reported: '*We were surprised that women smell the sanitary napkin before they use it*' [case 2.5]. Observations were not used only to understand habits but also to check their underlying meanings: *'You have certain images in your mind, built from the Dutch context and not from the intended users' location. You need to be there to really understand it. In a session they used*

the words "climbing wall"; you imagine a whole wall of bricks, and then find the reality is a few bricks only' [case 2.2].

Interviews – Designers need to bridge the language gap

> 'We should really have an in-depth experience, like being with them longer or for several days, and see how they live, by observing and by in-depth interviews. But I think that would take a lot of time.' [Dutch student, case 1.3, quote 181]
>
> 'We had an interview of four hours; that was quite long, but the transcript was only three-and-a-half pages. I do not believe it. Is there not more? … The facts were in the transcript (weight etc.), but that was not interesting.' [Dutch student, case 1.4, quote 63]

In most of the cases, interviews were combined with participatory sessions (as examined in Section 3.5.1). The largest barrier was in the form of a language gap. Difficulties and limitations regarding interpreters as well as the tools that design students developed to cross this language gap have been discussed.

The examples again display the many biases that designers can possibly encounter, and they demonstrate as well that the designer's own experiences within the local situation can reveal them. Practice-based learning by observation coupled with other research methods seems to be very important for understanding the meaning of information from reports and other second-hand data sources. At the same time, the designer – as an outsider – needs to be aware of his or her own influence on intended users. Not only are the outsiders biased – insiders' reactions to outsiders also have an impact on how one understands a culture. The culture-conscious design tool could provide examples of dedicated means and strategies to avoid biases. Moreover, the tool could stress the importance of local research carried out by the designers.

3.5.4 Designers influenced by their own background

> 'Every team member had his/her own interpretation … each of us sketched the [imagined] day of a Chinese couple, and the HK students laughed … it was not like that at all.' [Dutch student, case 1.1, quote 338]

In the international workshops, design students used different frames of references to understand their intended users. They applied what they knew from their own background, and they also interpreted information about their intended users differently, or else had difficulties in interpreting.

For example, in an i.do workshop, 'easy to reach participants' were selected, due to the limited time. These were highly educated people who did not fully represent the target group. The design students filled this gap of knowledge by falling back on their own references concerning what they knew about similar people. One foreign student who designed for the elderly stated: *'I used information about what I know from my own grandmother'* [Dutch student, case 1.3, quote 172]. Some design students suggested studying similar intended users in their home country first, in order to compare and determine the cultural differences. They suggested that team members share their frames of references by sketching, for example, 'a day in the life of an intended user' within their own culture, and then discuss the results in the team.

Conclusion

To the third question – What do designers do to understand the culture of their intended users? – the answer is that they use a wide variety of methods and tools, and are creative enough to overcome obstacles. Nevertheless, designers can be helped to decrease the uncertainty they feel regarding the appropriateness of their design methods and tools.

Various barriers could be explained by Hofstede's dimensions, and, in the examples that illustrate findings, this is indicated by an abbreviation of the relevant dimension: for example, 'high PDI'. The analysis of these barriers helped sharpen the lens for the purpose of examining culture.

Apropos the remark in Section 3.3.4, designers should be advised to first study similar intended users in much the same situations in their home country in order to compare them with the targeted intended users in unfamiliar cultures. This frame of reference would help designers identify what is and what is not specific to a culture.

3.6 Discussion and conclusions

This chapter has shed light on a wide range of barriers and solutions that designers encountered while attempting to understand the culture of their intended users in a cultural context with which they were not familiar.

The questions to be answered in the cases studied were:

1 What are the designers' reasons for taking culture into account? (Section 3.3)
2 How do designers deal with the concept of culture? (Section 3.4)
3 What do designers do to understand the culture of their intended users? (Section 3.5)

The findings will help us to understand better what tool might be of most benefit to designers. Furthermore, they have already helped us to gain a clearer idea about the concept of culture as seen from the perspective of the designer, as well as regarding the complexity of Hofstede's dimensions, and how they can be used to distinguish cultural values and practices from other relevant values and aspects.

3.6.1 A lens to help designers examine culture

The cases studied illustrated the complexity of the concept of culture. Designers have difficulties in distinguishing what is based on personality, on culture, and on human nature, though one can argue of course whether that is a problem. Is it necessary to know what causes differences? The distinctions help designers to reduce blind spots, and – more importantly – to broaden their scope, which in turn gives them much greater space in which to design. For example, if designers can see a value as typical for a specific group – and not as a universal value – they are able to rethink this value and question it. If they do not see the specific value, because it is taken for granted or seen as universal, they are not able to question it. If designers know their own cultural background, and can build a reference, they can see more clearly the contrast with the culture of their intended users. Consequently, they will be better equipped to predict the cultural impact of their designs. A better understanding of their own cultural as well as personal values will help them to achieve the desired design direction. Furthermore, a lens tailored to examine culture will also help designers to better delineate the cultural group of intended users. It will provide a better – or more explicit – understanding as to what extent culture should be taken into account, or which cultural values are points of departure in a design project. Finally, an optimally adjusted lens will also help designers to adopt a conscious position regarding stakeholders.

Framework

How can we assist designers in sharpening their lens? One way is to offer a framework. The reasoning model, an element of the first-stage framework (see Figure 2.22), proved helpful in categorising the barriers in a meaningful way. The dimensions and onion model were beneficial in clarifying barriers in participatory design methods such as Contextmapping. The assumption is that, in the same way, the framework used to study the cases can be useful for designers. This topic will be explored further in Chapter 4.
In addition, we could use the dimensions in a more prescriptive manner, to prescribe, for example, conditions for participatory sessions. In these kinds of sessions, intended users need to feel free to express their deep-seated wishes and needs. To achieve this, the situation could be as follows (see Figure 3.24).

Hierarchy is as low as possible (low PDI); individualism is high (high IVD); sensitivity regarding gender roles and achievement is low (low MAS); and the fear of ambiguity and making mistakes is as low as possible (low UAI). Knowing all this, designers could construct their sessions in such a way that they match with these values as closely as possible. For example, they could tune the selection of participants (gender specific), the form and content of materials (meaning), and the selection of facilitators (attitude and gender) to the cultural group.
In the same way, these dimensions could be used in a generative way to determine a design direction rather than to explain or to study culture. Possibilities regarding

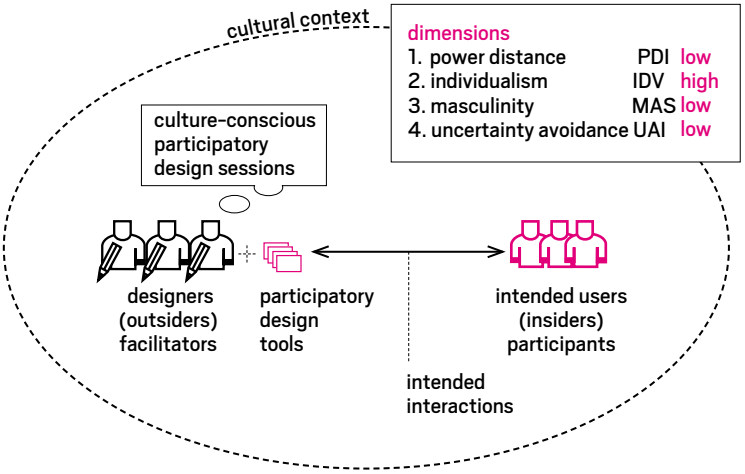


Figure 3.24 Possible guidelines to tune participatory design sessions

the use of elements of the framework in a generative manner will be explored further in Chapter 4.

3.6.2 Guidelines and content for the design tool

Many barriers have been found that relate to culture, which in turn gives rise to the need to help designers avoid these obstacles. Fortunately, we can also conclude that designers are creative enough to find their own means of overcoming barriers. In particular, their skills in visualisation and three-dimensional prototyping comprise an important contribution, enabling them not only to bridge the communication gap but also to cross cultural barriers. Nevertheless, there is room for improvement, and more dedicated preparation could help designers avoid certain barriers altogether. As stated earlier, we could provide design students with a sharper lens to examine culture. Furthermore, we could support their reasons for taking culture into account, by providing examples. And finally, we could provide them with guidelines and examples regarding how to conduct cultural research by means of tuned methods and dedicated tools.

By way of the design tool, I envision supporting designers by reducing the complexity of the notion of culture and limiting blind spots. This would be achieved by providing a lens to look at the culture of intended users, aided by examples that illustrate the practices of culture in designs. Designers often work in teams and with various stakeholders, all of whom influence the extent to which the particular culture is examined. Therefore, the tool should be shared easily, include insights that apply to the local as well as the non-local context, and be implemented in different stages of the design process. In the first instance, the tool should support a utilitarian goal: that is, by being an effective and efficient

means whereby designers can become familiar with the culture of intended users, and realise what that could mean for their designs. At the same time, the tool should fit in the current culture of the design discipline. Design considerations relating to the tool will be explained further in Chapter 5.

Three categories

To conclude, the tool will address three categories of concerns (see Figure 3.25).

1 The tool should help designers become aware of the reasons – or intentions with regard to these – they need to study the culture (**why?**). There are various reasons either to study culture or to overlook it. If designers know why – and preferably also to what extent – culture should be taken into account in the design process, they will be able to work more effectively as well as justify to the parties involved their reasons for studying the culture.

2 The tool should provide designers with a better lens to examine culture (**what?**); a framework to examine culture in a meaningful way could help designers distinguish culture from personality and from aspects based on

the tool: 3 categories + content

Why? Designers' reasons for studying culture		What? Designers' knowledge relating to the study of culture		How? Designers' activities relating to the study of culture	
To avoid blind spots and more	Section	A lens to look at culture in the context of a design project	Section	Methods, tools and tips to examine the cultures of the intended users	Section
To avoid mismatches between product and users	3.4	Distinctions of designers' concerns (reasoning model)	3.3	Set boundaries, determine the cultural group	3.4
To know one's own personal and cultural values in order to deal with external influences	3.4	Distinctions between personality, culture and human nature (definition of culture)	3.4	Compare cultures	3.4
				Tune participatory methods	3.5
To generate new ideas (cultural differences as a source of inspiration)	3.4	The importance of boundaries relating to the cultural group	3.4	Use dedicated tools (preference booklets, family cards, workbooks)	3.5
To go from local to global designs or vice versa (to bridge cultures)	3.4			Use a variety of tools (observations, interviews, role-playing, photo-elicitation, product confrontation)	3.5
To rethink local values, which opens up the design space	3.4				
To bridge cultural chasms in participatory sessions	3.5			Ask permission, be attentive to reciprocity and manage expectation of intended users	3.5
To understand the meaning of desktop findings for a specific culture	3.5				

Figure 3.25 Three categories and content for the culture-conscious design tool, based on findings presented in Sections 3.3, 3.4, and 3.5

human nature. This would help them feel more confident that they are not overlooking cultural differences, and would help them to prepare their contextual research or cultural study in a conscious manner.

3 The tool should support designers' activities in seeking to understand the culture of their intended users (**how?**). To this end, we determined various guidelines to tune design-research methods and tools, and were able to develop new ones. These will be of distinct benefit to designers in their preparations to undertake contextual user research.

The statements in Figure 3.25 are derived from the insights described in Section 3.3 tot 3.5. They summarize content – expecting to be helpful for designers – for the tool, see also Figure 1.21 and Figure 3.27 for an overview of the tool development process. Before going into further detail about the design tool (Chapter 5), in Chapter 4, we will first take a closer look at the cultural lens.

3.6.3 Issues to address in another empirical research step

In this Chapter 3, a broad set of cases was studied; hence, the study can be characterised as a bottom-up approach in design practice (see Figure 3.26). This was useful to understand better the value of the first-stage framework developed in Chapter 2 from a more top-down point of view.

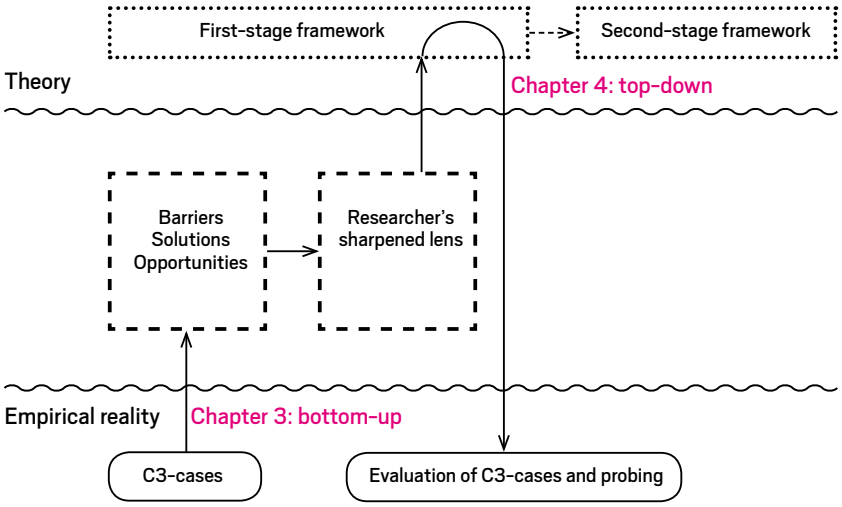


Figure 3.26 From a broad bottom-up study to a structured top-down investigation

The first-stage framework helped to identify and explain cultural barriers (dimensions and onion model), and to link them with concerns that are relevant to designers (reasoning model). The identified barriers, solutions, and opportunities helped to sharpen the lens for the purpose of examining culture. With this more

finely adjusted lens, we will go back to a selection of cases in Chapter 3, because in some of these the design students used cultural models (elements of the framework). In a more top-down approach, described in Chapter 4, we will return to these selected cases to see whether and how models were used. In addition, the possibilities of using elements of the framework (dimensions and onion model) in a generative way will be explored (probing).

C4 Insights from investigations

Moving from a first-stage to a second-stage framework

The previous chapter discussed how designers deal with culture in the design practice. The cases highlighted the complexity of culture in design, along with the cultural barriers that designers encounter as well as the solutions they come up with. In addition, the cases illustrated the opportunities for culture-conscious design, and the relevance of studying the culture of intended users. The studies sharpened our lens to facilitate a more efficient examination of cultural aspects, and resulted in content and guidelines for development of the design tool.

In the present chapter, we examine this cultural lens more closely, and consequently the development of the framework. We also refer back to certain cases where designers used cultural models (elements of the framework). Furthermore, this chapter presents findings from investigations regarding elements of the framework in design projects. Together with what we learned from the literature, the insights gained were used to improve the framework and to develop further guidelines for the tool's development.

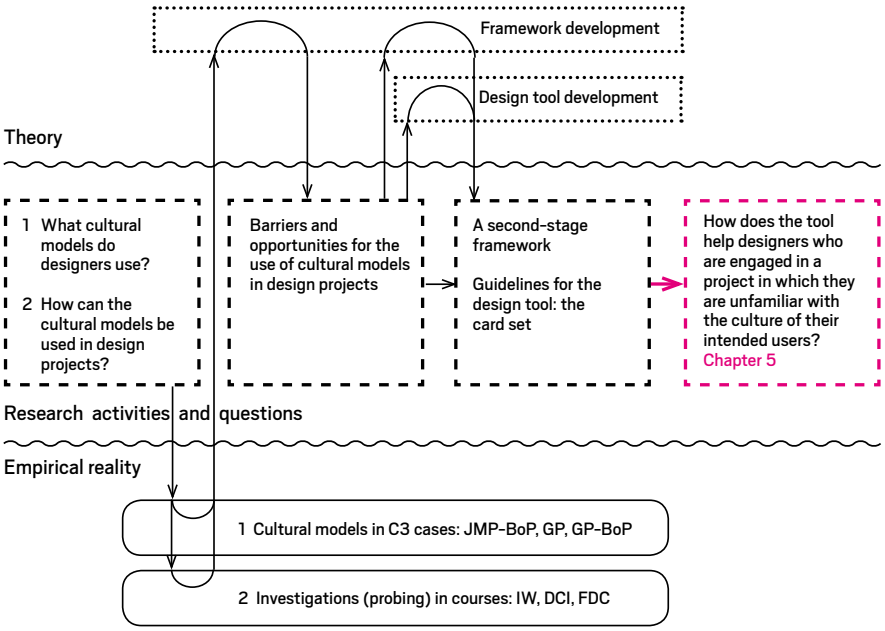


Figure 4.1 Overview of research activities

4.1 Research approach – General outline

Figure 4.1 shows an overview of the approach followed, together with three questions that will be answered in this chapter. In addition, it features two sets of

data sources (C3 cases and courses) from the design practice, and two instances indicating where we refer back to theory. The aim is to increase our understanding of how cultural models help designers.

The first question was:

1 **What cultural models do designers use?**
From the cases in Chapter 3, it was found that designers in several projects used models from cultural anthropology. From these cases (referred to in this chapter as C3 cases, and explained further in Section 4.1.1), it was possible to identify the barriers and possibilities that designers encountered while using the models. Moreover, the benefits could be translated into opportunities to use these models in design projects, and to further develop the framework. We then moved to the second question:

2 **How can the cultural models be used in design projects?**
The barriers and opportunities identified led to ideas to improve and further develop the models. They were modified and implemented by students, and the possibilities were explored in various projects. A further description can be found in Section 4.1.2. Insights from these investigations or probings, together with the cases studied, resulted in being able to determine the barriers associated with the use of cultural dimensions. Because the former barriers were viewed differently, owing to new insights, it was necessary to elaborate further.

For answers, extra literature – in addition to that discussed in Chapter 2 – was examined. The sharper lens, developed during investigations and a study of the cases, made it possible to select and scrutinise the relevant literature. As a result, additional insights were used to develop a new set of dimensions.
Finally, all insights were applied to build a second-stage framework and to devise guidelines for the design tool, presented in Section 4.4.

4.1.1 Evaluation of cultural models in C3 cases

This section gives an overview of the studied cases:

- Joint Master Projects in a BoP context (JMP-BoP);
- GP-BoP (Graduation Projects in a BoP context);
- Graduation Projects (GP).

The JMP-BoP, GP-BoP, and GP cases were described in Chapter 3. Cases selected for further study were those in which models from the framework and other models from the discipline of cultural anthropology were applied. The data sources were reports, along with data from interviews, and the manner in which data was analysed is described in Section 4.1.5. The models most widely used were Hofstede's dimensions and his onion model. Table 4.1 displays an overview of the selected projects and applied models, and an overview of all the cases and related topics can be found in Appendix 1. References to the project reports can be found in the Reference Cases section.

Projects	Hofstede's dimensions	Hofstede's onion model	Other models
JMP-BoP	Five cases: 2.1, 2.2, 2.3, 2.5, 2.12	Seven cases: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.12	Two cases: 2.1, 2.3
GP-BoP	Five cases: 3.9, 3.11, 3.12, 3.14, 3.15	One case: 3.11	One case: 3.11
GP	Two cases: 4.3, 4.4	One case: 4.2	Two cases: 4.3, 4.5

Table 4.1 Overview of selected projects and applied models (see also Appendix 1 and Reference Cases)

4.1.2 Probing in design courses

This section provides an overview of observations in the courses:

- International Workshop (IW);
- Design and Cultural Impact (DCI);
- Food Design and Culture (FDC).

These three courses were selected because of their international focus. It was clear in advance that cultural aspects could play a role in design.

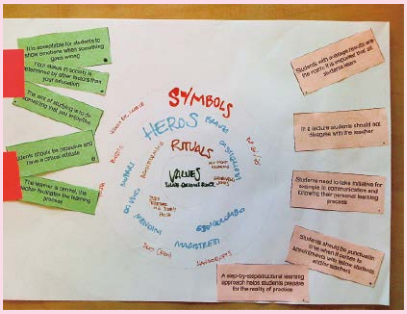
Observations – International Workshop (IW)

The half-day International Workshop was an introductory event for new international design students at IDE, and it took place just before the start of the first semester of their new master. The aim of the workshop was to help students get to know one other by sharing something they had in common as well as something that was different due to diverging cultural backgrounds. Students were also asked to share their design school experiences. These explorative sessions were carried out twice, once in 2009 and again in 2010.

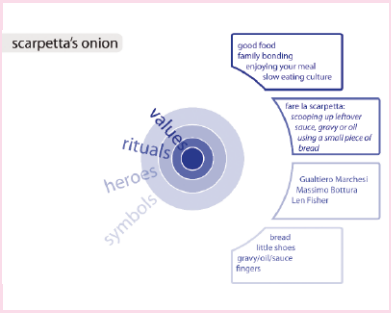
Setting – In one year about forty students representing more than eight different nationalities attended the workshop, where they were divided into teams grouped by country of origin (e.g. Chinese, Taiwanese, Mexican, Spanish, Swedish, Dutch, South Korean, Italian, and Turkish). The workshop was guided by the researcher and co-guided by two IDE colleagues, whose professional task was to support international students.

Assignments – After a short introduction to the onion model, the students used it to work on an inventory of design school experiences. They were also asked to select value statements, presented in pairs, that best fit their culture: for example, *'competition between students is important'* versus *'good results do not automatically make you the best student'*. These statements were inspired by Hofstede's value questionnaire, the assumption being that the onion model was an effective means to identify cultural values and related practices.

Deliverables – After the analysis, students were asked to prepare a poster featuring their onion model and statements, and to present it to another group (for an example, see Figure 4.3).
Research aim – The aim of the probing was twofold: to ascertain whether Hofstede's onion model helped students to identify and share differences, and to facilitate a better understanding of the meaning of the model.
Research approach – Observations and notes were made during the sessions. The posters were reviewed to determine whether the students understood the model, and whether the results supported the aim of the workshop. Evaluation of the workshop was carried out by the researcher, assisted by the two IDE colleagues, and included an inventory of results and improvements.

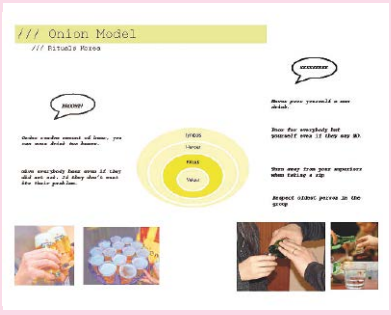


An impression of a poster with value statements and practices (from IW course)



Values and practices: visualised result of the analysis of 'fare la scarpetta' (an Italian practice of cleaning one's plate when finishing a meal) (from FDC course)

Use of an onion model in a generative session with intended users in Kenya (from JMP-BoP course)



A comparison of two rituals: drinking beer with colleagues on Friday afternoons, in the Netherlands and in Korea (from FDC course)

Figure 4.3 Examples of completed onion models

The onion model was used as a tool in an icebreaker session for students to get to know one other, not only in IWs but also in C3 cases. A quote from a C3 case report reads: *'The tool generated positive results … better understanding of other members. It also worked as an ice-breaker … insights helped the researcher to be better prepared for the field research phase* [case 2-12, 2012, p.21].

Investigation – Design and Cultural Impact (DCI)
Design and Cultural Impact is a bachelor elective course that teaches the cultural meaning of things: namely, how to analyse socio-cultural processes related to form, image, meaning, ethics, and aesthetics. Approximately 100 students attended the course, guided by a team of tutors and lecturers in design. The DCI was conducted in 2011.

Setting – During a series of lectures, the students attended one lecture about cultural theories, including Hofstede's six dimensions.
Assignments – The theme of the course was 'sports and games'. Students were requested to select a sport or a game, and to bring six pictures depicting that sport or game to the lecture (for two examples, see Figure 4.4). Students were asked to position their pictures on the six dimensions printed on A0 posters (for an example, see Figure 4.5). The intention was for the student to understand the dimensions by relating the sport or game to shared values considered to be typical

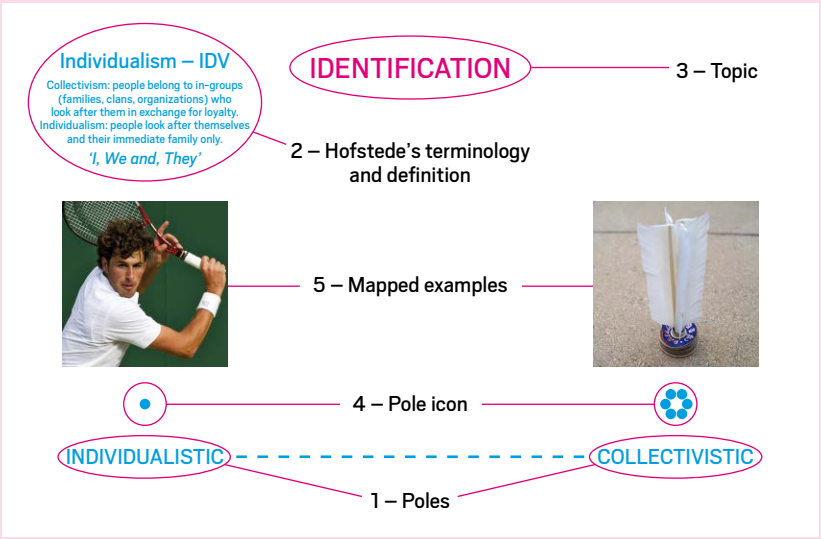
Tennis (high MAS, high IDV)

In tennis, the aim is to win, and individual achievement is extremely important. This is stimulated for example by the tennis ladder, which is a competition schedule. Through played matches, members climb or descend their tennis club ladders.

Ti Jian Zi – Circle Kick (low IDV)

This is a traditional Asian game, the aim of which is to keep a shuttlecock in the air by kicking it. The game is played in a team, with members staying in a circle, trying together to keep the shuttle from touching the ground. Each team member is concerned with success as a team, and there are no individual winners.

Figure 4.4 Two game-card examples for the game-card mapping session



The dimensions were presented as opposite poles (1) with their original names and definition (2) in the left upper corner (as explained by Hofstede). Hofstede's names were accompanied by a topic name (3). The assumption was that by distinguishing the name of the dimension (indicating the topic which along a culture would be assessed) from the poles (the range of possible assessments), the dimension could be understood and memorised more easily. It had already been observed in this stage of the research that designers had difficulties understanding clearly the meaning of some dimensions. For example, masculinity (MAS) was interpreted as the dominant role of men, though this is a simplification of the dimension, and does not do justice to what is meant. Each pole was accompanied by a simple icon (4) to help students remember the meanings. Two examples were mapped (5).

Figure 4.5 Example of an A0 poster for the game-card mapping session

for that sport or game. For example, with tennis, identification of the individual could be assessed as high, because the entire focus is on individual benefits and not on benefits for a specific group. With Ti Jian Zi (Figure 4.4 (right)), however, identification of the individual could be assessed as low, because the benefits are based more on experiences shared by the group rather than on the self-expression of the individual. The assumption was that by linking the dimensions with products, design students might become more aware of how products relate to cultural values (the symbols in Hofstede's onion model).

Deliverables – The result was a set of six posters with the mapped games and insights from plenary discussions.

Research aim – The aim of the investigation was to understand more fully the possibilities afforded by Hofstede's dimensions: namely, how they could be represented, understood, and used by designers in a meaningful way.

Research approach – The representation of the six dimensions on the posters had been adjusted on the basis of previous insights (Figure 4.5). The assumption was that the new representation would help designers to understand the dimensions in a meaningful manner. The results were discussed in a plenary session, during which the six posters with mapped games were reviewed.

Investigation – Food Design and Culture (FDC)
Food Design and Culture was an elective master course in which design students learn to study cultures, using culture-related models and theory based on the first-stage framework, and to apply insights regarding development of a design direction. The central topic in this course was food, in relation to culture-specific recipes, contemporary food consumption rituals, cooking tools, branding, and cultural identities. Between 25 and 30 students (and five students in 2009) attended the course, guided and coached by the researcher and a colleague. The FDC course took place in 2009, 2010, 2011, 2012, and 2013.

1 – Power distance (PDI)
(low-high)

A domestic grill inspired by Churrasco, a Brazilian style preparation of meat. The product evokes a high hierarchy interaction, since one person in the group is supposed to take the lead in cutting and serving the meat. The manifestation of the design (the designer used the metaphor of a Taurus) evokes a masculine and powerful connotation.

Designed by Gregory Jamin (2009)

2 – Individualism versus collectivism (IDV)
(I-we)

A fondue set illustrates the importance of the group sharing food together. The hierarchy is low, and sharing is an important value. At the same time, the example shows some individuality within the group; everyone can choose a different fork, distinguished by its colour.

Figure 4.6 Five of Hofstede's dimensions, illustrated with products; the sixth dimension, Indulgence versus Restraint (IVD), is relatively new (2010), and therefore not always included in assessments

Setting – Each week, students attended lectures and coaching sessions. In several lectures, the concept of culture was explained, based on the framework presented in Chapter 2. The dimensions were illustrated with examples of food-related products, including preparation, eating tools, and eating rituals. Figure 4.6 shows examples used in a lecture to illustrate the dimensions. Lectures with theory and examples from design practice were accompanied by coaching sessions and workshops.
Assignments – The students were asked to apply the onion model and dimensions in two group sub-assignments – design of a ritual and a tool – and one individual main assignment – design of a 'food kit'. For each assignment, there was an analysis and a synthesis phase. The 'food kit' was a do-it-yourself kit containing items typical for a specific culture and intended to be exported to another culture, where they would be sold in a supermarket.

3 – Masculinity versus femininity (MAS) (achievement - care)

A child's spoon in the form of an airplane, designed to tempt children to eat. The interaction can be valued as masculine, because it communicates the importance of achievement; the airplane has a clear goal.

4 – Uncertainty avoidance (UAI) (low - high)

This dimension appeared to be more difficult to illustrate by means of a product. If people prefer to avoid uncertainty, one could say that they do not like ambiguity, so a product needs to be straightforward, communicating clearly what to do with it. Products need to be recognised easily for their functions. This is illustrated here with a spoon-fork product for outdoor usage. The product shows an ambiguous use; there is no clear function.

5 – Long-term orientation (LTO) (short - long)

The dimension is illustrated by the 'slow food movement' represented with a slow cooker. The assumption is that cultures that score high on this dimension look after the next generations. They are less focused on quick results, and therefore are more interested in sustainable and future-oriented solutions.

Designed by Margriet Foolen for Royalvkb

Deliverables – Each student delivered a report with a cultural study and design results, a poster, and a three-dimensional model of the kit. An example of a 'food kit' result is presented in Figure 4.7.
Research aim – The aim was to find to what extent Hofstede's onion model and dimensions support cultural analysis and are helpful in developing a design direction.
Research approach – The research had a strong investigative character, which meant that new insights were gained via discussions with design students and by examining their results, recorded in reports. The five students who participated in the 2009 course were interviewed (Section 5.2.2).

It is known that people in Italy eat spaghetti with only a fork. However, outsiders believe that the correct and Italian way to eat spaghetti is with a fork and a spoon. Playing with the notion of this cultural practice, the design student decided to bridge the gap between what is actually done within a culture and what other cultures think is done. He proposed a plate with an imprint of a spoon. The idea is that one can use the hollow imprint to twirl the spaghetti around with the fork, in which case, a real spoon will no longer make sense. Hence, the need for it is eliminated, but the design still fits the perceived cultural identity for which the student was aiming. The product design contained a plate, a small bundle of spaghetti, a fork, and a recipe booklet.

Designed by Stefano Oliva

Figure 4.7 Example of a food kit

4.1.3 Researcher's role and research methods

As explained in Section 1.2.4, the roles of the researcher were various and mostly intertwined. During the studies, the roles most filled were those of design educator and tool designer (number 3 and 4 in Figure 1.21). During the investigations, models were adjusted and tried to comprehensibility and usefulness (tool designer's role). Prior to application, the models were explained in lectures (design educator's role). As described in Section 1.2.4, combining roles had disadvantages and advantages. On the one hand, the researcher influenced the subjects of study, and could control the outcome; on the other hand, it was helpful that the researcher was closely involved in order to identify the barriers and opportunities regarding the models in the context of a design project, and to collect arguments to underpin conclusions. Reports and presentation slides made it possible to analyse the findings.

The diverse projects and investigations were conducted at various times between 2008 and 2013. The studies themselves were undertaken whenever time permitted, since the researcher was combining teaching and coordination obligations with research activities. In 2013, a conference paper (van Boeijen, 2013) was published on the cases and investigations, as well as on the literature described in Section 4.3. The data were freshly analysed for the research relating to the present thesis. As with the cases and data presented in Chapter 3.

4.1.4 Data collection and analysis

As stated earlier, the results from C3 cases and the observations in courses are based on the researcher's experience during the courses, on the evaluation of course results (posters, reports, three-dimensional models), and on interviews (C3 cases and FDC course 2009). The student results showed whether the models offered had been understood and applied as intended, and whether they had contributed in a positive manner to the design project. Questions pertaining to the results and the transcriptions of the interviews were:

1 Which models did design students use?
2 How, when, and where did design students understand and apply the models?
3 What barriers and limitations did design students encounter?
4 Why, when, and where were the models helpful?

Intermediate insights were implemented to adjust assignments in the subsequent IW and FDC courses.

4.2 Results and discussion

This section summarises insights derived from the cases studied and from observations. It describes what models were found, how they were used, and what barriers and opportunities were identified for the application of these models.

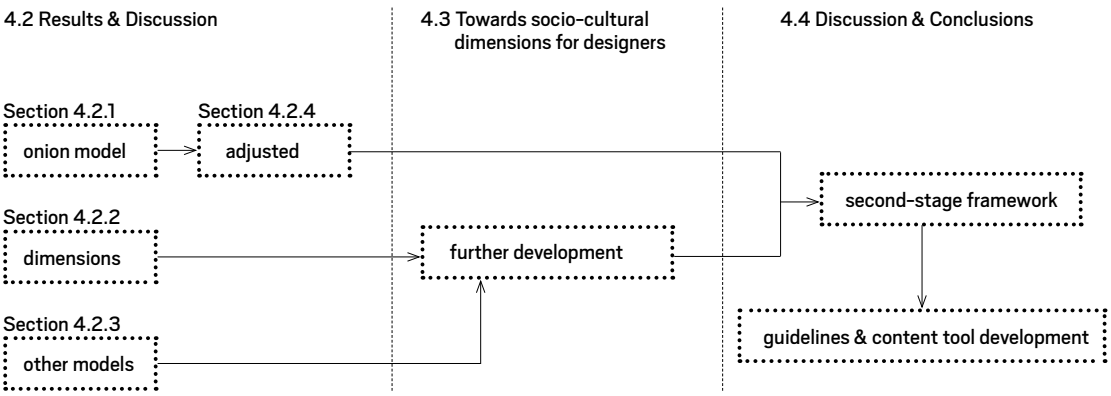


Figure 4.8 Structure of results presented in Sections 4.2, 4.3, and 4.4

We will see that the dimensions, together with insights from other models, are developed in more detail. Together with an adjusted onion model, this will constitute input for development of the second-stage framework, which will be input material for the tool (Figure 4.8).

4.2.1 Hofstede's onion model

The onion model was applied in various ways, further explained below. Usage, barriers, and opportunities are described for each study (C3 cases, IW, and FDC). The section concludes with a proposal regarding an improved onion model.

C3 cases

Teamwork – The onion model was used in the preparation stage for design students in an international team to get to know each other. As in the IW sessions, students completed a poster with their onion illustrating their country of origin. The sessions contributed positively to the team-building process.

Research questions – At the beginning of the research phase, the onion model was used to generate culture- relevant questions. One student extended the model by adding an outer circle with context factors such as economy, demography, technology, and politics. Practices could also be identified on this higher and more abstract level [case 3-11, 2010, p. 24]. In some C3 cases, outcomes were very general. For example, the comparison of two national cultures led to a superficial inventory of rituals, heroes, and symbols that did not seem to be directly relevant for the project. Nevertheless, it could be a good way for designers to start, especially if they know very little of the national culture, let alone the more specific culture of their intended users. In projects where the boundaries of the context were smaller, the results were much more substantial, and contributed to the development of a design direction.

Comparison of cultures – In an early stage of the research phase in the design process, the model was used to identify differences between the target culture and the designers' culture. Dutch students presented two onions comparing the values and practices of toilet use: one related to their student accommodation and the other to a slum in Kenya [case 2-3, 2010, p.36]. Another team compared two cultures on a national level. These comparisons helped them become sensitive to possible differences and similarities. Although cultures were also compared with the scores on Hofstede's dimensions, the connection with the onion model was not made. For example, the onion model was not used to analyse how a high score on PDI was reflected in the different layers.

Participatory sessions – In some cases, the model was applied during the contextual research phase to use as a tool in participatory sessions. A large poster of the onion graphic was placed on the wall, and filled in by means of Post-it notes (for an example, see Figure 4.3).

Reporting findings – At the end of the contextual research phase, the model was used to structure and record findings. In several cases, the model was helpful in communicating findings.

International Workshops

Get to know – The model was used in an introduction session, to help students get to know each other by sharing examples that highlighted what was common and what was different in their respective backgrounds. The use of the onion model worked well and as intended, and was a useful tool to generate lively discussions about each other's national and design school background. The design heroes (design role-models) that the design students mentioned were various, and often not known by students from other nations. Mention of them was very useful, however, because it triggered discussions that made students aware of differences. Sometimes they discussed the values these heroes represented, and many details were exchanged, ranging from the two weeks of compulsory military service undertaken by Chinese students to the 'iron ring' as a symbol for Canadian engineers. Personal and more culture-specific statements were also discussed, and of course students from the same culture and school did not always agree on their cultural values.

Presentation – At the end of an inventory, the model was used to structure and present results.

Food Design and Culture

Comparison of cultures (analysis) – In an analysis phase, the model was used to assess a contemporary food ritual, and to compare differences within that ritual in the different students' countries of origin. The onion model, as intended, helped students to analyse a specific food ritual and to develop a new one (for an example, see Figure 4.5). As in the cases, students used the onion to compare different rituals, although the definition of a ritual was used in a broad sense and with a wider scope than intended by Hofstede, including not only traditional rituals but contemporary ones as well, such as having a late-night snack after an evening out. Discussion about the distinction between a routine, a habit, and a ritual was helpful as well, as it heightened understanding of what the design of a ritual could entail. Students found it difficult to design a ritual, as they first tended to think of physical products, without considering the underlying values. They found it hard to approach a ritual as a course of events in which the time factor plays an important role. Some students felt that the term 'heroes' was too strong, but if it were replaced by 'role models' or 'representatives , they could then think of possibilities in the context of their project. Some students took the term 'symbols' literally, not including practices such as behaviour, gestures, and artefacts. The term 'symbols' in fact entails many more aspects relevant to designers.

Similar to the C3 cases, the onion model was not seen to be linked directly to Hofstede's dimensions.

Idea generation (synthesis) – In the synthesis phase, the model was used to develop a new ritual.

Reporting findings – The model was used to structure and visualise findings in the analysis and the synthesis phases.

Conclusions

- The onion model was useful both in the design research and the conceptualization phase, and to achieve various goals (improve teamwork, generate research questions, contribute to participatory sessions, generate ideas). Furthermore, it was a helpful structure for the purpose of communicating culture-related findings. Due to the multidisciplinary character of design (as defined in this thesis), it was evident that numerous insights would need to be transferred to stakeholders. The onion model could be used to summarise cultural findings.
- Remarkable was that the onion models were not used to analyse a specific value related to a particular dimension. Design students did not easily see the connection between the onion model and cultural dimensions; instead, they seemed to prefer using the onion model in a more generic way, with a set of values not necessarily measured along one of the cultural dimensions.
- The definitions of symbols, heroes, and rituals were comprehensive, and not in tune with the jargon and context of the design discipline. Since designers also need to consider values other than cultural ones, it would be helpful to indicate explicitly the type of values.

4.2.2 Hofstede's dimensions

The dimensions were used mainly in three ways:

C3 cases

Comparison of cultures (analysis) – In most cases, the dimensions were used to sensitise designers with regard to the target country. They compared the scores and sometimes also filled in Hofstede's survey to compare results with their own individual scores. However, the scores were not always applied for the specific target group. For example, average scores for South Africa did not match the identified values of the intended users in townships [case 2-5, 2010]. In fact, the scores did more to confuse the designers than to contribute to a better understanding.

Participatory sessions – In contextual research, the dimensions were a useful means to analyse and translate findings into guidelines for cooperation with stakeholders, and to tune participatory sessions (composing user groups that could easily express themselves, and develop the appropriate sessions and materials (see also Chapter 3, Section 3.5).

Design direction – In some cases, the dimensions were used to set the design goal and to develop guidelines for the design, indicating the preferred values. For example, in the cabin-crew rest area project [case 4-3, 2010], the designer stated that the compartment should maintain a comfortable ambience, providing room for individual expression (high IDV), low hierarchy (low PDI), and ease of use (low IND). The dimensions were helpful to determine the cultural values that would need to be upheld in terms of the design.

Design and Cultural Impact (DCI) and Food Design and Culture (FDC)
Understanding the dimensions – The illustration of dimensions by means of products was an effective way to render the theory meaningful for designers. Immediately after the DCI lecture, for instance, a student expressed her appreciation of the way the dimensions had been presented. She had been familiar with the dimensions, she said, but had never seen their direct link to products. However, it also became clear that the mapped games needed explanations regarding the imagined context or situation, as mapping depended on these. For example, rugby could be mapped as a sport with low hierarchy if we consider the attention to teambuilding, singing songs, drinking beer with the opposing teams, and the lack of visible rank displayed in sportswear. On the other hand, if one considers the context of a particular rugby club, where new members are obliged to demonstrate their commitment by kissing a bone and drinking copious amounts of beer, that could be seen as an expression of hierarchy on the part of older members of this club. Thus, the stories behind the mapping session are important to understand their meaning.

Barriers
In C3 cases, DCI and FDC barriers were found, along with possible pitfalls regarding use of the dimensions. These are categorised into three statements, as follows.

1 Scores were not applied correctly:
   - The scores were used without critique. They limited the designers' view, and gave them a false sense of security. Designing is complex, since the designer is participating in a process of change. For example, if the cultural group scores high on Individualism (IDV), it does not mean that the intended product should be suitable for individual use. Due to the individualistic culture, it could be challenging to design something that mediates collective use. The model, used as a quick scan, evoked a overly quick response on the part of the designer, leading to a narrow view and to missing the complexity of the process of meaning and change;
   - Scores were not applicable for specific groups within different countries. This was expected, since the scores were valid for averages of large groups, measured on a national level. The students did not design for intended users that necessarily represent the average values of countries, but for groups within countries, or for intended users across countries. Therefore, the scores did not automatically apply for the specific groups and contexts for which they were designed. Though the scores sensitised designers as to possible cultural differences, they could not be applied on a one-to-one basis.
   - Differences in scores between cultures did not necessarily lead to different products. The scores could not explain all practices, so a one-way interpretation was not valid. However, that did not mean that the

scores were completely useless, as they were instrumental in sensitising the designers regarding a specific, potentially important value. The scores could not be used to predict cultural values.

2 Definitions and names were not fully understood, and were sometimes misleading:
   - The names of the dimensions emphasised extremes such as Masculinity (MAS) and Indulgence (IDV), which did not communicate the movement between poles (dichotomy), and subsequently the dynamic character of cultures. It is important for designers to be aware of this movement, since their process is characterised by change;
   - Some names referred only to one aspect of the dimension. For example, Masculinity refers to both gender roles and to a preference in society for achievement or care. The designers spent little time studying the meaning of each dimension, since in the context of the design project, they had little time to study the theory;
   - Not all the names fit with the way designers approach their work. Uncertainty Avoidance (UAI) and Long-term Orientation (LTO) were too abstract to help them imagine possible manifestations into products. All the names had been developed in an academic context, rather than adapted to the pragmatic approach common to practicing designers.

3 Dimensions were not easy to apply:
   - Clear connections between dimensions and the onion model were not made. Although the onion model could be applied for each value assessed along each dimension, designers did not recognise the link. This is probably because it was not emphasised sufficiently in lectures, and also because taking several values together in one onion model already seemed to be helpful. Students did not realise that an onion model could be filled in for each dimension assessment. In the framework, this relation could be made more visible by showing an onion for each dimension;
   - It was helpful to illustrate the dimensions with product examples. However, some dimensions were easier than others for both the researcher and the design students to translate into products. The dimensions Power Distance (PDI), Individualism (IDV), Masculinity (MAS), and Uncertainty Avoidance (UAI) were able to be explained better – and with more product examples – than Long-term Pragmatism (LTO) and Indulgence (IND).

Conclusions

- As with the onion model, the dimensions were useful for designers in both the analysis and the synthesis phase, and for various aims (to compare cultures, to do participatory sessions, to develop a design direction).
- The scores were misleading, and should be used carefully or not at all, because (1) they limit the designer's view (strict conclusions regarding product

design cannot be made); (2) they usually do not apply specifically to the targeted cultural group; and (3) they cannot explain all cultural practices. The dimensions need to raise designers' awareness and sensitise them regarding possible differences, rather than measuring and predicting exact differences.
- The names should be tuned to the design discipline because (1) they do not show the dynamics of culture; (2) they do not cover the whole meaning of the dimension; and (3) the terminology is not in tune with the pragmatic reality of designers.
- The dimensions should be explained using products as examples, since this helps designers to understand their application.
- A specific context or situation is needed to understand the meaning of a value for a specific dimension.

4.2.3 Other cultural models

In five C3 cases, the application of other models were identified: (1) Lewis' communication model (Lewis, 1999); (2) Trompenaars' dimensions and onion model (Trompenaars and Hampden-Turner, 1998); (3) Hall's P-T time, high-low context communication; (4) Hall's theory about personal space (Hall, 1976); and the Circle test (Cottle, 1967) on time-orientation, presented earlier in Figure 2.9. They were used in various ways:
- In the preparation of local contextual user research to generate guidelines;
- In the analysis phase to determine the design direction;
- In addition, Hofstede's triangle (see Section 2.1.1) was used to visualise differences and commonalities between Kenyan and Dutch practices, and related directly to the topic of the design project.

Hall's theory about time and space was a useful addition, whereas his other theories partly overlapped Hofstede's dimensions. The Trompenaars and Hampden-Turner's model as well as Lewis' communication model also overlap slightly with the dimensions. These theories will be taken into consideration in a further analysis of the dimensions in Section 4.3. The Circle test appeared to be a useful tool for gaining insight into the orientation towards time (related to Hofstede's dimension Long Term Orientation [LTO]). This simple test was not used as an isolated measurement tool, but was applied together with other methods, such as interviews and observations, and it was helpful in building the designer's understanding of how intended users' perceived time.

Space – different ways to deal with personal space

Further to the above, the notion of personal space differs between cultures (Lewin, 1936; Hall, 1976; Trompenaars, 1998). Lewin divided cultures into diffuse and specific. Some cultures prefer to have clear boundaries between public and private space; products are not shared easily, and the public space is relatively small; however, once people are friends, the private spaces are large and diffuse (diffuse cultures). Other cultures prefer to share spaces easily; public space is

large, but as a friend you may share one specific space only, meaning that in one context you may be seen as a colleague and in another as a friend (specific cultures). An example mentioned by Trompenaars and Hampden-Turner (1998, p.85) involves the use of his refrigerator by an American friend. This person helped himself without asking (specific culture), while Dutch people would consider the refrigerator to be a private space that one does not enter without the owner's permission (diffuse culture). Hall distinguishes intimate, personal, social, and public spaces. What does this mean for designers? These cultural influences as regards dealing with space could be interesting, especially in public spaces where people from different cultures encounter each other, such as at airports and on airplanes.

4.2.4 Conclusions – Tuning the onion model and reconsidering the dimensions

The question now is this: What is the significance of these findings in terms of developing the second-stage framework and the tool?

Onion model – The model is easily accessible, is an effective aid for designers, and can be used in various ways and with diverse goals. For our framework – and consequently for the envisaged tool – a tuned model is proposed (see Figure 4.9).

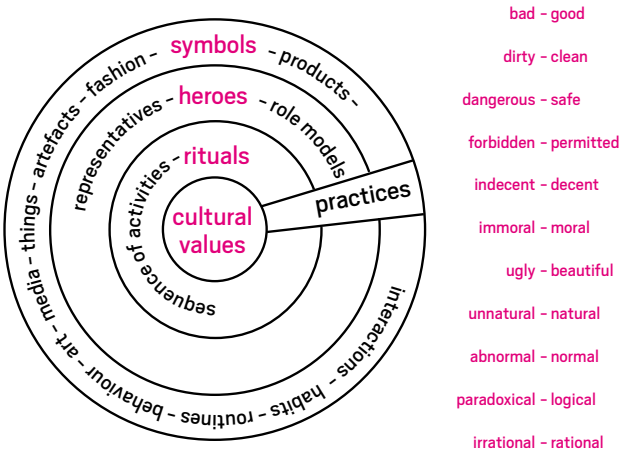


Figure 4.9 Onion model (based on Hofstede, 2005)

The names of the layers have been maintained, but extra ones have been added to explain their meaning.
This model will be used in the second-stage framework, in which the link with the dimensions should be emphasised. This will be explained in Section 4.4.1 at the end of this chapter.

Dimensions and other models – The dimensions are basically useful for designers to sensitise and prepare them for possible cultural differences. They also help to explain these differences (as we also saw in Chapter 3) and to structure and report findings. The investigations demonstrated that it is possible to illustrate the explanation of dimensions with products, and that there are opportunities to use them in a generative way. However, there are also barriers as well as an overlapping with other models. This overlapping of meanings of models from different theories results in designers needing to make an extra effort to get to grips with them. Hence, together with the barriers, this leads to the conclusion that it would be advantageous for designers to have their own set of dimensions. For the development of this tuned model, however, extra literature is needed.

4.3 Towards socio-cultural dimensions

Because the dimensions did not meet the designers' needs, several models to typify culture had to be studied again. These models were compared, and the result was a new set of dimensions, which was also published (in stage A).[13]

4.3.1 Additional models to typify culture

In addition to Hofstede, other scientists in the field of culture have studied and developed cultural dimensions. The reason for choosing Hofstede's model in the first instance was explained in Chapter 2, Section 2.1.3. However, now that the limitations for designers are also known, the other models will be examined more closely.
Table 4.1 shows an overview of models developed over the years.

The overview shows seven sets of dimensions, compiled from a study of various publications (Hofstede, 1997, 2005, 2006; Hofstede et al., 2005, 2010; Minkov, 2007; Trompenaars and Hampden-Turner, 1998; House et al., 2004; Schwarz, 1994a, 1994b; Peterson, 2004; Ingelhart and Moreno, 1998; and Ingelhart and Baker, 2000). Already in the first half of the 20th century, anthropologists (Inkeles and Levinson [1969, published originally in 1954]) were convinced that all societies shared the same social problems, and that social groups acted upon these problems differently. Hofstede developed these basic common problems into a set of dimensions (1980, 1991, 2005) (Table 4.1), while Minkov and Hofstede (2011) explain how developments generated by other scientists contributed to the evolution of their work, and dimensions were refined and added.

[13] van Boeijen, A.G.C. (2013) *Socio-cultural dimensions to sharpen designer's cultural eyeglasses.* In proceedings of Engineering and Product Design Education Conference, 5-6 September 2013, Dublin, Ireland.

Inkeles, Levinson	Hofstede, Minkov, Hofstede	Schwarz	Trompenaars, Hampden-Turner	The GLOBE study: House et al.	Peterson	Ingelhart, Moreno, Baker
1 Relation with authority 2 Concept regarding oneself 3 Ways of dealing with conflicts	1 Social inequality (PDI) 2 Relationship between the individual and the group (IDV) 3 Concept of masculinity and femininity (MAS) 4 Ways of dealing with uncertainty and ambiguity (UAI) 5 Long-term Orientation (LTO) 6 Indulgence versus Restraint (IND)	1 Conservatism 2 Hierarchy 3 Mastery 4 Affective autonomy 5 Intellectual autonomy 6 Egalitarian commitment 7 Harmony	1 Individualism versus Communi-tarianism 2 Achievement versus Ascription 3 Neutral versus Affective 4 Universalism versus Particularism 5 Attitudes to Time 6 Specific versus Diffuse 7 Attitudes to the Environment	1 Power Distance 2 Institutional Collectivism 3 In-Group Collectivism 4 Gender Egalitarianism 5 Performance Orientation 6 Humane orientation 7 Assertiveness 8 Uncertainty Avoidance 9 Future Orientation	1 Equality and Hierarchy 2 Direct and Indirect 3 Individual and Group 4 Task and Relationship 5 Risk and Caution	1 Well-being versus Survival 2 Secular-Rational versus Traditional Authority

Table 4.1 Overview of sets of cultural dimensions

Although the work of some of these scientists was criticised (Hofstede, 2006), Hofstede and Minkov state that there is no best way to construct dimensions. They take the pragmatic stance that it depends on what researchers seek to predict and explain, on which dimensions they take, and that the dimensions should be easy to understand. Our goal is not primarily to predict behaviour but to sensitise designers regarding possible culture-specific design behaviour, and to connect that to possible practices that can be mediated by products. In addition, we look for ways to apply the dimensions in a pragmatic manner. For this reason, the comparison focuses not on the validity of the set of dimensions but on its applicability in the design context.

For a comparison of the dimensions, the following aspects were examined: naming (used terminologies), number, ways of representation, use of product examples to illustrate the meaning of a dimension, and content (definitions, similarities, and differences).

The different sets from diverse scientists were compared by means of a matrix. This matrix can be found in Appendix 4 Cultural Dimensions. Those dimensions that showed certain similarities are presented in one row. In addition, the other cultural theory, presented in Section 4.2.3, is incorporated.

Naming – Some names and definitions are similar to those given by Hofstede. In the GLOBE study, his dimension Masculinity versus Femininity is divided into two dimensions: Gender Egalitarianism and Performance versus Human Orientation. This division is a useful improvement, because it makes it easier to understand that masculinity refers not only to gender roles but also to care and achievement, values that can be important both to women and men. However, the name Egalitarianism refers to only one side of the pole. In line with my own observations regarding dimensions, Peterson (2004) states that in his work – as business consultant and professor – the terms most used by scientists are confusing and not well understood. Therefore, he replaced certain words with other ones, emphasising the dichotomy with arrows (Figure 4.10).
Number – Hofstede's first dimensions were developed in the 1970s, with the sixth dimension being introduced relatively recently (2010). The GLOBE study developed nine dimensions by splitting up some of Hofstede's. The set of five dimensions proposed by Peterson (2004) has been developed for pragmatic reasons, and for application in an international business context. He composed five dimensions, which comprised a maximum that he found people could handle. This illustrates a dynamic and pragmatic approach regarding the development of dimensions, and it will be followed with regard to development of the dimension for designers.
Representation – Earlier, we saw that it is useful to show designers the dichotomy, using more than one of the poles, and others also demonstrate the importance of showing these poles (Trompenaars and Hampden-Turner, 1998; Peterson, 2004). Trompenaars and Hampden-Turner go even further, as shown in Figure 4.10.

The authors represent a dimension in a circle, emphasising the dynamics of cultures, and that – although a culture may value one pole more than the other – it needs both poles to perform well. Therefore, they represent a dimension in a circle with arrows that indicate the movements, reconciling both extremes. However, this view was developed for a business context, targeting effective cooperation, and does not fit our goal, because it depends on the design vision and aim of the designer irrespective of whether both extremes are balanced or not.
For designers, visualisations are important motivators, inspirers, and reminders. Terms such as 'creativity', 'ambiguity', and 'empathy' are also lacking, but could help anchor the new theories in the designer's mind.

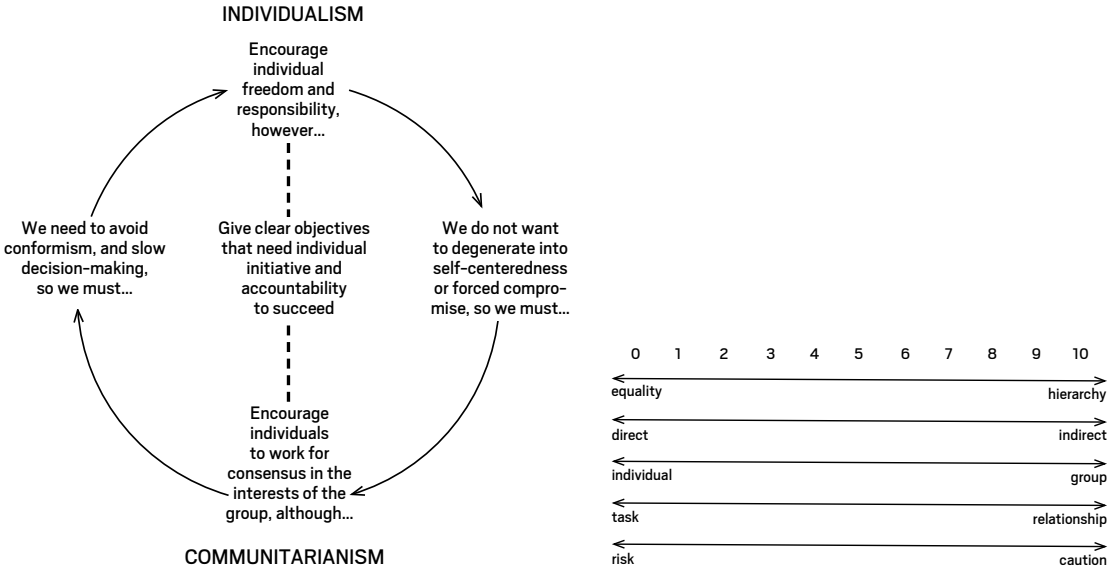


Figure 4.10 Left: The representation of the dimension in a circle shows that cultures are dynamic and deal with both poles (Trompenaars and Hampden-Turner, 1998, p.197); right: the representation of the dimensions shows the dichotomy (Peterson, 2004. p. 33)

Product examples – In a study of the literature, another shortcoming (for application by designers) appeared; only certain values were illustrated with products, and visuals were seldom used. Hofstede in particular used many examples of behaviour to illustrate how values – along the dimensions and using the scores – are expressed in society, education, work, religion, and shopping, but not how these are manifested in products. A drawing of the world on the cover of a book was the only visual that House (2005) used. The example of Trompenaars, and Hampden-Turner was one of the few that were close to the interest of designers (Figure 4.11).

The rollercoaster example shows that different scores on the dimension 'neutral versus affective' has meaning for product designers. The American design of a rollercoaster needed adaptations for Japanese users. '*The engineering of such rides require the design engineer to provide a series of accelerations and twist to excite with just enough respite to recover before the next thrill. Western joy riders scream and wave their arms to participate in the spirit of experience... In spite of a well-proven design, Japanese riders continued to receive head injuries. Observations revealed that the Japanese riders were more likely to keep their heads low or forward in a semi-bowed posture, thereby striking their heads on the bar designed to hold them in place, rather than taking a more upright, arm-waving position. Expensive modifications were required that prevented head injuries*' (Trompenaars and Hampden-Turner, 1998, p.78).
The Japanese preference for 'neutral' and the Americans preference for 'affective' expression were used to explain the observed behaviour.
It illustrates that an analysis of possible different values between cultures (here on a national level) could help designers to ask relevant questions. This could limit their blind spots concerning possible mismatches between product-user interactions. But to do so, the designer should connect the cultural value and the dimension (along which the design will be analysed) to the practices. Designers could then use the onion model to ask questions relevant for each dimension.

Figure 4.11 This example shows the influence of a cultural value on the design of a rollercoaster (Trompenaars, 1998, p.78)

Content – A comparison of each dimension's meaning has been made in a matrix, presented in Appendix 4 Cultural Dimensions. The dimensions that show similarities are in one row. Some rows are split into two, because for one dimension generated by a theorist, another theorist developed two. Only one dimension is not used in some way or another in the sets of dimensions generated by other scientists; this is Trompenaars and Hampden-Turner' dimension 'Attitude to the environment', which had to do with cultures that see the major focus as affecting their lives, and the origins of vice and virtue as residing within the person versus being controlled by nature (Trompenaars and Hampden-Turner, 1998). For the other dimensions, there were at least two scientists who developed a similar dimension. In the next section, we will see how these comparisons have been developed into a set of socio-cultural dimensions for designers.

4.3.2 Goal and guidelines for the development of cultural dimensions

Insights from further analyses of the dimensions have been used to develop a new set. The envisioned design goal is a set that helps designers to ask relevant questions. These questions should contribute to (1) an optimal preparation for examining the culture of intended users, and to (2) the development of a design direction. The set aims to help designers gain a thorough understanding of possible different values between cultural groups, not only to anticipate likely barriers but also to generate new possibilities. The proposed set will neither replace nor improve upon current sets of cultural dimensions; instead, it will be implemented in a wholly different way and with an entirely different goal.
The barriers that were revealed in the cases and during observations, along with insights from the literature, led to guidelines for the development of this new set of dimensions.

Guidelines for the design of the socio-cultural dimensions

Content

1 Select those dimensions that are relevant to designers. These are the ones that show how the values – chosen along these dimensions – could be practiced through design in a specific context (based on findings from Section 4.2.2).
2 Select the dimensions in such a way that together they cover the relevant theory found so far, including the theories about time (polychronic and monochromic), space (diffuse and specific), and communication (low- and high-context) (based on findings from Section 2.1.4 and Section 4.2.2).[14]
3 Chose a name for the set that represents the envisioned user-centered, culture-conscious approach.

Usability

1 Chose for each dimension a representative topic name and names for the two poles, in such a way that designers can easily refer to them. The poles should show the dynamics of the dimensions: the possibility of moving between the two poles (based on findings from Section 4.2.2).
2 Include the dimensions 'the ones we do not know yet' in order to communicate that the set might not be complete, to stimulate the designer to think beyond the limitation of a model, encouraging the designer to consider other possible differences (based on findings from Section 4.2.2).[14]

[14] A substantial offering, covering the relevant theory, is more important for designers than a small set that is easy to remember (based on literature and the investigation in the courses presented in this Chapter). Empirical findings have shown that (1) designers were capable to handle more than five dimensions and (2) the selection of the relevant dimensions was situational.

4.3.3 Socio-cultural dimensions in design

The creation of the set was an iterative process, as will be described in the next chapter by the basic design cycle (Figure 5.2). The first ideas were incorporated into the tool that was applied and tested in design projects. Furthermore, the matrix in Appendix 4 was an important means of comparing the different sets and determining how they are related to the new one (right column in the table of Appendix 4). Figure 4.12 (left) shows the proposed set. Four elements are relevant to discuss here. The name of the set is 'socio-cultural dimensions' [1], to distinguish it from existing ones, and also to emphasise that the dimensions refer to social values that are specific for a cultural group (for a specific time and situation).

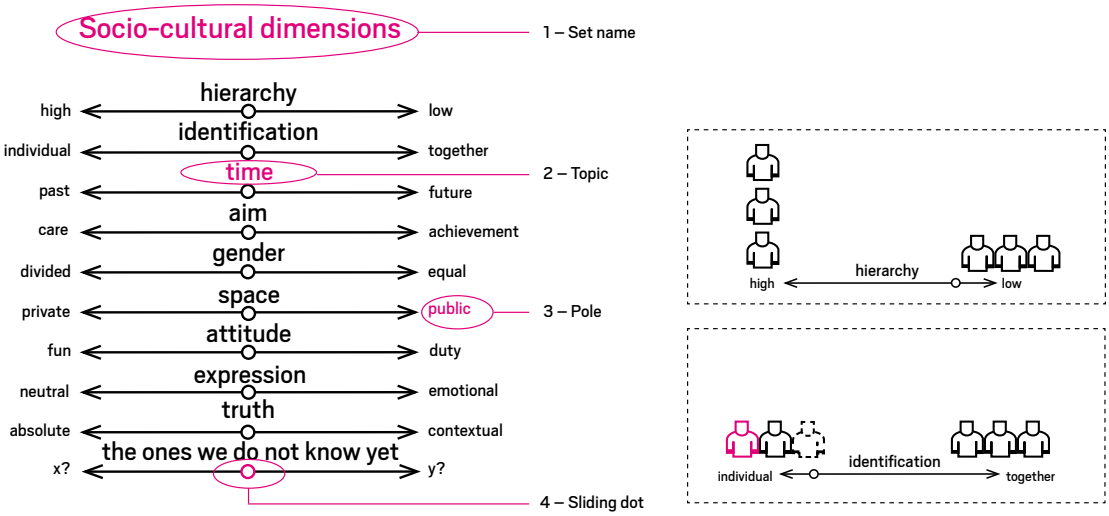


Figure 4.12 Left: socio-cultural dimensions for designers; right: two examples with pictures and with sliding dots indicating the important values

There are nine dimensions and in addition 'the ones we do not know yet', each with a topic name [2] to help the designer understand the meanings of both extremes (or poles) [3]. The nine dimensions cover as closely as possible the models and theories that are relevant for designers. The arrows and 'sliding dots' [4] suggest the dynamics and that there is not one fixed score. For each extreme, visuals are added to explain them. Figure 4.12 (right) shows two examples. Each dimension is explained in Table A4-1 of Appendix 4 Cultural Dimensions. As shown in this table, all the proposed socio-cultural dimensions for designers are based on existing dimensions and include also other theory (Hall, 1976; Levine, 2006; Cottle, 1967; Lewis, 1999; Lewin, 1936). Similar to House et al., Hofstede's dimension 'masculinity' has been split up into two dimensions (one related to gender and one to social aim), because designers understood 'masculinity' mainly as related to gender roles, and the values care, and achievement were neglected.

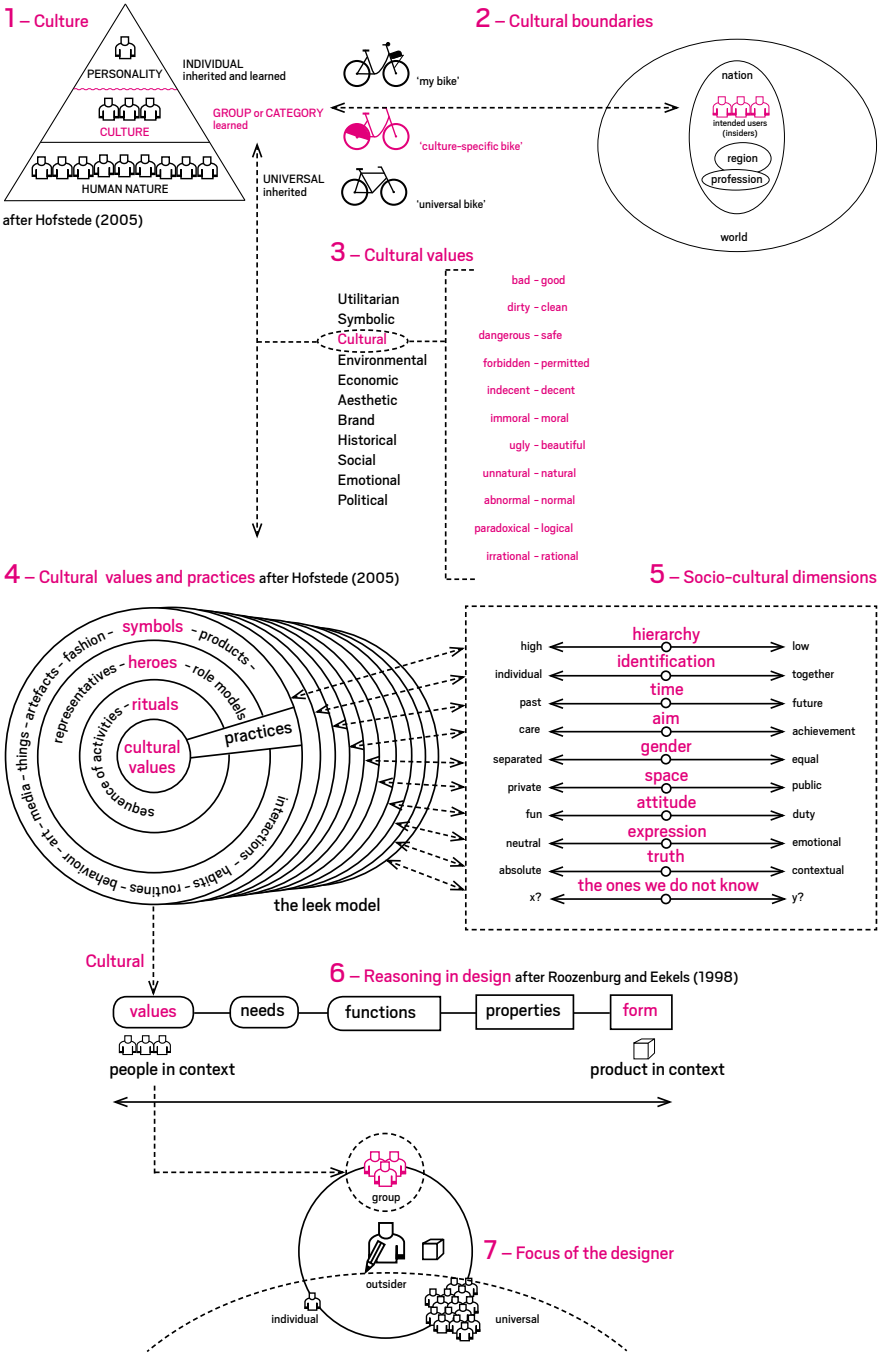


Figure 4.13 Visualisation of the second-stage framework

4.4 Discussion and conclusion

The evaluation of the selected C3 cases and the investigations in the courses helped to answer the following questions.

1 What cultural models do designers use?
2 How can the cultural models be used in design projects?

The findings have led to adjustments of the onion model (element of the framework) and a redesign of the cultural dimensions. Together with insights from Chapter 3, a sharpened image of the framework needed to examine culture in the context of a design project was created.

The section ends with new guidelines for development of the design tool.

4.4.1 A second-stage framework

There are seven elements that help us to frame culture for user-centred, cultural-contextual research. The numbers in Figure 4.13 do not indicate a specific order, but are used as a reference to explain the specific elements of the framework. Maintained are (1) the triangle that defines culture; (2) cultural boundaries; (3, 4) the model that distinguishes cultural values and practices; (5) the socio-cultural dimensions; and (6) the reasoning model that links culture with the design discipline. However, the dimensions and the onion model are replaced for reasons given earlier in this chapter. Furthermore, the connection between the dimensions and the onion model is affirmed, as each dimension is linked with one onion model, with the onion layers together forming the image of a leek. Mirroring the reasoning in the design model emphasises the importance of reasoning from values to form, and reasoning in two directions is mentioned explicitly. Finally, the framework presents (7) the designer in the middle of three perspectives, affirming that in the design discipline the principles of human behaviour are examined from different perspectives, based on individual, group, and universal values.

1 **Culture** – For a definition, the one mentioned in Chapter 2, Section 2.1.1, is still appropriate. And although culture is a complex phenomenon in which individual, group, and universal aspects easily intertwine, the distinctions culture, personality, and human nature are used, and are helpful for designers.
2 **Cultural boundaries** – If designers wish to examine the culture of their intended users, it is important to set boundaries and define a specific situation at a particular time and in a particular place. Products are used in various situations and in diverse cultural groups. Intended users may be involved in many groups and adjust their behavior to whichever cultural group they are in. Statements about a culture become too general or false if the boundaries are too wide.

3 **Values and cultural values** – The core of what is cultural comprises the shared values in a specific group of people (e.g. good versus bad). These values are emphasised and particularised, because designers are concerned not only with cultural values but with economical and utilitarian ones as well (see Chapter 2, Section 2.3.2). In this framework, cultural values are seen as a typical set in a range of values as presented.
4 **Cultural values and practices** – On the basis of the C3 cases and the investigations, it is concluded that the onion model is useful for framing culture. The figure shows how extra terms are added to help designers in their thinking about various practices associated with cultural values. The relationship with the set of dimensions is emphasised visually, and, similar to the onion as a metaphor for the layers, for the set of onions the term leek is used.

the tool: 3 categories + content

Why? Designers' reasons for studying culture		What? Designers' knowledge relating to the study of culture		How? Designers' activities relating to the study of culture	
To avoid blind spots and more	Section	A lens to look at culture in the context of a design project	Section	Methods, tools and tips to examine the cultures of the intended users	Section
To avoid mismatches between product and users	3.4	Distinctions of designers' concerns (reasoning model)	3.3	Set boundaries, determine the cultural group	3.4
To know one's own personal and cultural values in order to deal with external influences	3.4	Distinctions between personality, culture and human nature (definition of culture)	3.4	Compare cultures	3.4
				Tune participatory methods	3.5
To generate new ideas (cultural differences as a source of inspiration)	3.4	The importance of boundaries relating to the cultural group	3.4	Use dedicated tools (preference booklets, family cards, workbooks)	3.5
To go from local to global designs or vice versa (to bridge cultures)	3.4	Values: cultural values and practices	4.2	Use a variety of tools (observations, interviews, role-playing, photo-elicitation, product confrontation)	3.5
To rethink local values, which opens up the design space	3.4	Socio-cultural dimensions to generate culture-specific questions, to analyse and synthesise	4.3	Ask permission, be attentive to reciprocity and manage expectation of intended users	3.5
To bridge cultural chasms in participatory sessions	3.5	Cultural values and other values	4	Generate culture specific questions and ideas (socio-cultural dimensions and onion model)	4.3
To understand the meaning of desktop findings for a specific culture	3.5	The designer's concerns	4	Sensitise regarding other cultures (onion model)	4.2
				Compare cultures	4.2
				Learn from the past	4.2

Figure 4.14 Three categories plus content for the culture-conscious design tool, completed (in pink) with findings presented in Chapter 4.

5 **Socio-cultural dimensions** – Hofstede's dimensions in the first-stage framework are replaced by a new set of socio-cultural dimensions that help designers determine along which dimensions values and related practices can be viewed. This is an important function of the cultural lens.
6 **Reasoning in design** – The central element that connects cultural theory with the design discipline is the reasoning model.
7 **Focus of the designer** – This element of the framework shows that designers must not look at intended users as members of a group, but also examine values based on individual preferences and based on human nature as well.

4.4.2 Guidelines and content for development of the design tool

In Chapter 3 we saw that the tool should contribute to the design process in three ways (see Section 3.6.2):

1 **Why?** – Make designers aware of the relevance of culture conscious design;
2 **What?** – Provide the designer with a lens suited to examining the target culture; and
3 **How?** – Support the designer by means of methods and tools to study the culture of intended users.

Most findings from Chapter 3 contributed to the first and third guidelines, while insights from this chapter contributed mainly to the second guidelines and to a lesser extent to the third one.

The second-stage framework elements comprise content for the second category (the What? category). In addition, in this chapter we have seen how some of the elements could be used to study culture in an analytical as well as in a generative way. These insights will be used as content for the third category (the How? category, see Figure 4.14).
In this chapter input for the development of the tool is mainly related to content of the tool. In the next chapter form, content and usage will be brought together in the development of the tool.

C5 Design tool – Crossing Cultural Chasms

A set of cards to help designers develop a culture-conscious approach

The development of the second-stage framework was explained in Chapter 4. The present chapter presents the argumentation for development of the design tool. It focuses on the creation of the tool in the form of a set of cards, and describes the development process and associated iterations. The subsequent testing led to feedback relating to both the tool as well as to the framework (for an overview of the research activities in this chapter, see Figure 5.1).

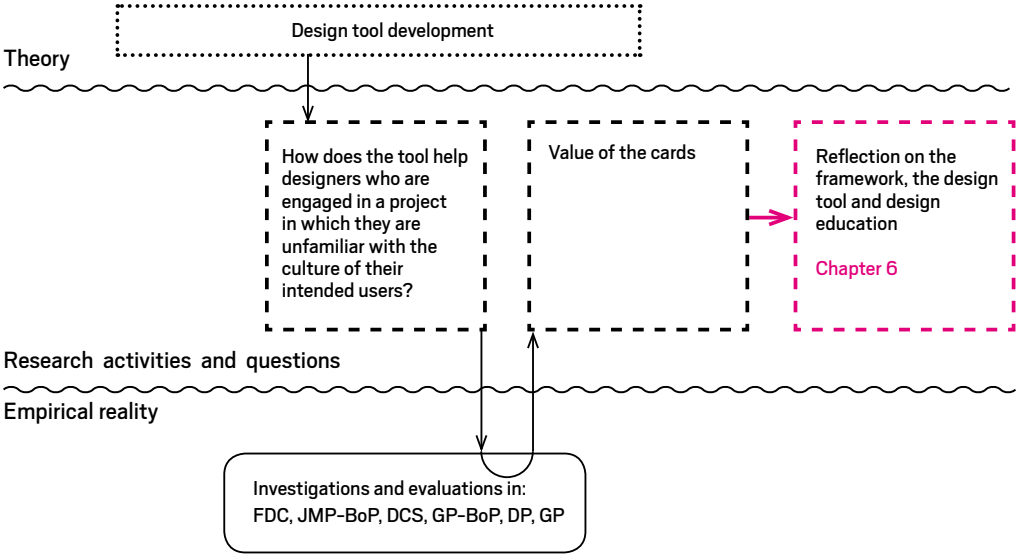


Figure 5.1 Overview of research activities presented in this chapter

5.1 Design approach

The present chapter briefly presents the design process. This thesis does not report the findings in a chronological manner, however, as the design tool was developed parallel to the studies presented in Chapters 3 and 4. Chapter 1 (Section 1.2.3) explains that the 'research through design approach' was taken. This means that the design process served two goals: it was a means to develop theory and a product to help designers construct a culture-conscious approach to design.
The initial concept had already been developed in an early stage of the research. Initial findings, published in conference papers (see Figure 3.3 in Chapter 3), were used to develop this Concept 1. New findings *through stage B analysis*, presented in Chapters 3 and 4, were used to develop Concept 2. It had been decided in an early stage that the tool would be in the form of a card set; arguments supporting this choice will be explained further in Section 5.1.1. The design of the card set was an iterative process, as visualised in the Basic Design Cycle in Figure 5.2.

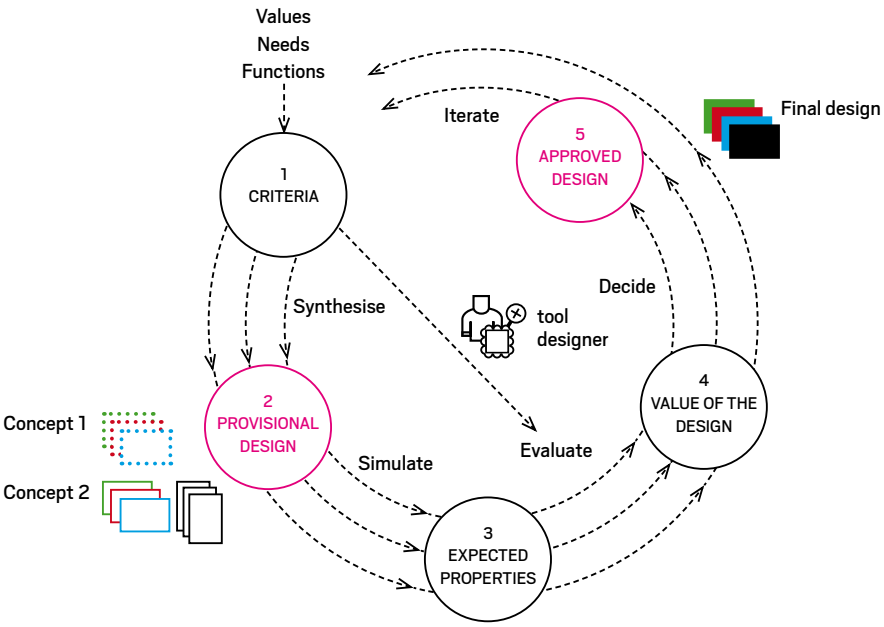


Figure 5.2 Diagram of the design tool (card set) visualised as an iterative process, following the 'basic design cycle' (based on Roozenburg and Eekels, 1995)

It began with the development of a representation of designers' values and needs, translated into functions (mode of use). Guidelines and criteria, derived from research presented in Chapters 2, 3, and 4, served as input for the synthesis. Provisional designs (concepts) were simulated (prototypes for the card set) and evaluated. Based on extra research in stage B, and on insights from the evaluation, the list of criteria was expanded further, and detailed in a subsequent iteration. This chapter presents three main iterations, involving Concepts 1 and 2 and the Final design, respectively.

Concepts 1 and 2 were tested and subsequently evaluated in various studies. The transitions from designing to evaluations and investigations in the design practice are as visualised in Figure 5.3.

Concept 1 (stage A research) – A first set of cards, with elements from the first-stage framework, and divided into three categories (explained in detail below). The cards were evaluated in: Food Design and Culture, elective master course (FDC) The main aim of the evaluation was to determine whether the cards had been understood as intended. This will be explained in detail in Section 5.3.
Concept 2 (stage B research) – An improved and completed version of the first set of cards, with elements from the second-stage framework, a procedure regarding

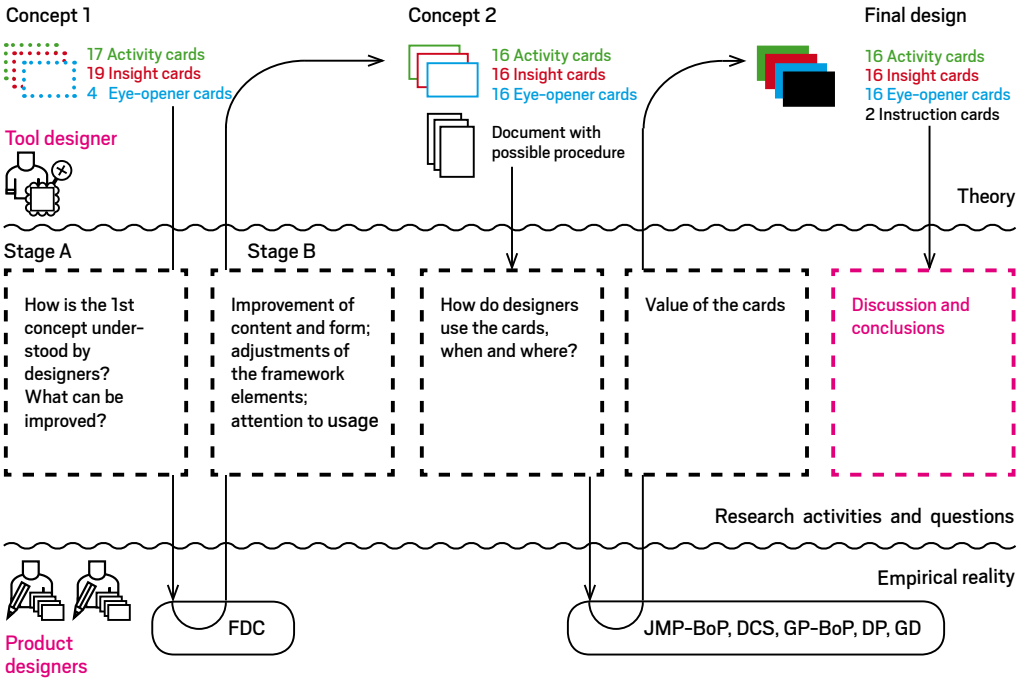


Figure 5.3 Tool design process; transitions between theory and empirical reality

use of the framework elements incorporated in the card set, and improved graphics. The cards were tested and evaluated, and possibilities were explored further in:

- Joint Master Projects-BoP, master course (JMP-BoP, 2013-2014)
- Design, Culture, and Society, master course (DCS, 2013)
- Graduation Project-BoP (GP-BoP, 2013-2014)
- Design Practitioner (DP, 2014)
- Graphic Designer (GD, 2014)

The main aim of the evaluation was to understand how designers had used the cards, and when, where, and whether the content, and the framework in particular, had contributed as intended. In Section 5.3 we will zoom in on details.

Final design (stage B research) – Insights from Concept 2 were implemented in a final design, which included improved graphics and text, an instruction card, and a website.

It is evident in Figure 5.3 that Concept 1 began with just four cards in the 'Eye-openers' category. This will be discussed in Concept 2, Section 5.3.

5.1.1 Design goal, guidelines, and criteria

The target group for the card set includes designers (as defined in Chapter 1), designing for intended users in cultures with which the designers are not familiar. The goal of the design tool is to help these designers develop a culture-conscious approach, and to examine the culture in a meaningful way. The envisioned situation is that with the tool designers will be able to (1) determine explicitly for what reasons and with what intentions a cultural study is needed, (2) to distinguish what is culture, and (3) to conduct cultural studies. Furthermore, with the tool designers will be better equipped to organize and justify the activities to team members or other stakeholders in the design project. The tool suits a user-centred approach, meaning that the focus is on the interests of the intended user. As explained earlier, in Section 1.2.3, another goal of the card set is to support the research of this thesis. Thus, the tool basically serves utilitarian values, and is tuned with shared cultural values typical for contemporary designers (as defined in Chapter 2), which our targeted designers belong. The tool is not based on the most advanced technology and does not communicate challenging values (for example, by using controversial examples, or by expressing an outstanding identity).

Form – For the determination of the form and properties of the design tool, various possibilities were considered, such as a physical or digital procedure, a website, a smart-phone application, and a board game. The form of the card set was chosen for the following reasons:

- Flexibility of use – First of all, the complexity of culture requires flexible use of the tool; it should not force usage in a fixed order, since culture plays a role in various ways and at diverse moments in the design process. Cards can be selected when and where needed; application is not linear. The front of a card can be used to inform the designer, and the back can be used to illustrate the front by way of an example.
- Sharing, prioritising, and being easily accessible – Cards can be selected and shared easily in a design team (Sleeswijk Visser et al., 2007), and with diverse stakeholders in different places and at various times. Cards (other than digital media) draw attention in group-meetings, and can be picked out and easily prioritised. In short, cards in a team could serve as a boundary object to synchronize the various perspectives (Star and Griesemer, 1998; Carlile, 2002; Smulders, 2006). Cards can be shared off-line, so an Internet connection is not needed, which is relevant in a BoP context.
- Only the essentials – A card has limited space in which to transfer information, which requires the developer to keep to the essence. Designers need to deal not only with cultural aspects but with many other features as well. They do not want to spend a lot of time reading. Therefore, compact and easily grasped information will be helpful. This limitation is also useful for the card set used as a research tool.

Obviously, a set of cards also has disadvantages, as they can be lost, and are liable to wear and tear. However, for the research goal in this thesis, a card set was satisfactory. Existing sets, such as the IDEO card set, Arup trend cards (Arup, 2006), Frog's Activity Tool Kit, and similar ones, were evaluated on their clearness (structure, amount of information, use of images, and text).

Design criteria for the development of the cards were clustered into three themes: (1) the specific **meaning** that the cards should evoke for designers, (2) the **content** that should be communicated, and (3) criteria regarding **usability** of the card set. These criteria arose from the literature and from the evaluation of Concept 1. The list of criteria can be found in Appendix 3.

The guidelines presented in Chapters 3 and 4 were used for the content of the card set, and resulted in the following categories:

1 **Why?** – Make designers aware of the relevance of culture-conscious design;
2 **What?** – Provide the designer with a lens suited to examining the target culture; and
3 **How?** – Support the designer in the form of methods and tools to study the culture of intended users.

The content, and subsequently the cards, are structured according to these three categories. In Concept 1, the elements of the first-stage framework were used to contribute to the second category: a lens to examine culture (what?). In this stage (stage A), there was little content that could contribute to the first guideline (why?), as there are only four cards (see Figure 5.3).
In Concept 2, elements of the second-stage framework (presented in Chapter 4) were used. This contributed to the second category: a lens to examine culture (what?). In this stage (stage B), numerous insights from the studied cases (presented in Chapter 3) could be used to contribute to the first category (why?). The insights and identified examples contributed to the activities that designers could engage in to understand the culture of their intended users. This is the third category (how?).

5.2 Concept 1 – Result of the first iteration

This concept is based on the research results found in stage A (see Figure 3.3).

5.2.1 Concept 1

Form – The cards were structured according to the above-mentioned categories (Why?, What?, How?), and have distinct names:

1 **'Eye-openers'** – Make designers aware of the relevance of studying the culture of their intended users. The name 'Eye-openers' refers to the relevance of culture-conscious design (answers on the Why?-question). The cards inform the designer of possible reasons to study the culture of the intended users.

2 **'Insights'** – Offer a framework within which to look at culture. The name 'insights' refers to an understanding of the concept of culture (answers on the What?-question). The cards inform the designer about the lens to examine the culture of their intended users.
3 **'Activities'** – Used by the designer to study the culture of their intended users. The name 'Activities' informs the designers about the studies that (s)he can perform to examine the culture of intended users (answers on the How?-question).

The categories were distinguished by colour (blue, red, and green) and by an icon, and the name for the card set was determined: Crossing Cultural Chasms. This metaphor refers to the effort that a designer (who is not familiar with the culture of her/his intended users) has to make in order to understand the intended users. The front of the card is reserved basically for theory, and the back displays an example (for an overview, see Figure 5.4)

Content – The content of the first design was based on the first-stage framework as presented in Chapter 2, but the design was not complete in this stage, since, for example, convincing product examples that illustrated theory had not yet been found. Standard photos from the Internet were sometimes used due to the limited possibilities of making or buying the appropriate pictures.

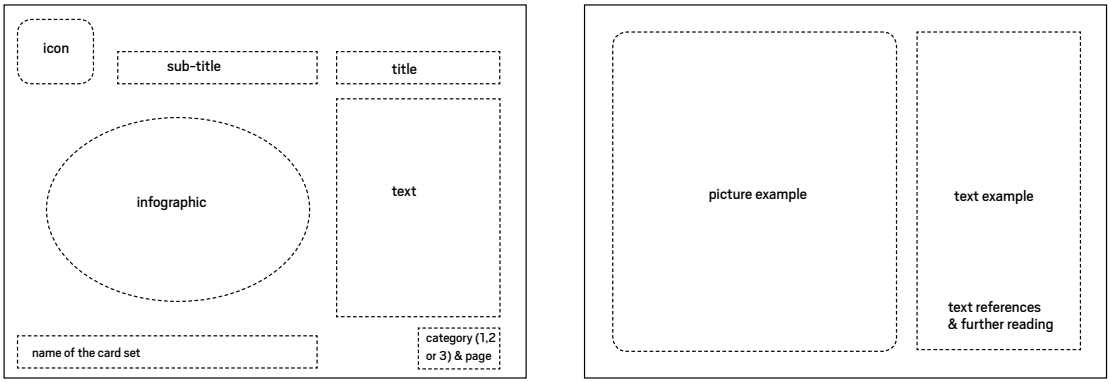


Figure 5.4 Lay-out of Concept 1

5.2.2 Evaluation of Concept 1

Concept 1 (for an impression, see Figure 5.5) was tested in the design course Food Design and Culture. The aim of the test was basically to determine whether the cards had been understood as intended, as described in the following section.

Figure 5.5 Impression of Concept 1 cards

Evaluation in Food Design and Culture course (FDC)

In 2009, five students attended this elective master course: two were Dutch, one was Armenian, and two were South Korean.

Setting – The aim of the course was to inform students about contemporary food rituals, tool design, and other food- related aspects.

Assignment – The assignment was to analyse food rituals, using Hofstede's onion model and cultural dimensions.

Deliverable – The final deliverable was a food kit: a 'box' containing ingredients, tools, and a recipe to assist the consumer in one culture to prepare and consume a food item from another culture. The kit was to be sold in a supermarket.

Research approach

Research task – Students were given the card set just after they had finished the course, and were asked to read the cards one at a time and to make notes on the cards about what they did not understand and about suggestions for improvement. They did not use them actively in their project, but they did apply the framework, which was explained in lectures.

Interview – In a one-and-a-half-hour semi-structured interview, the concept was discussed with the five students. The students brought with them a printed copy of the card sets with the notes, including questions, comments, and ideas for improvement.

Analyses – The interview was recorded and transcribed in order to reread their considerations regarding their notes. The findings were clustered and used to further enhance the design criteria and to implement some of the suggestions for improvement.

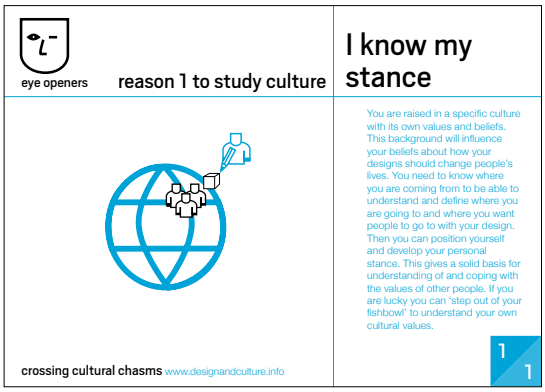
Insights – The students easily grasped the purpose and relevance of the card set. The main points of criticism had to do with form and understanding the cards. The amount of information per card (too much), structure and order of information, quality of images (too low or stock photos that were not perceived as convincing), missing examples (not identified yet), unclear pictograms (the 'i' for 'information' was interpreted as 'a blue fish- hook sign'), and the need for instructions on how to use the cards. The first category – 'Eye-openers'– made little sense to the students, because there were only four cards. Findings about the framework elements, investigated in FDC, were presented in Chapter 4, and will not be discussed again here.

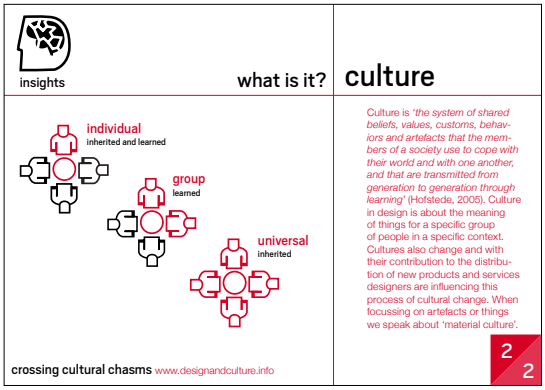
5.3 Concept 2 – Result of the second iteration

The first concept was improved and subsequently completed on the basis of new insights and findings from the research activities described in Chapters 3 and 4 (stage B) as well as from the testing described above, the resulting guidelines, and a more detailed list of criteria based on the first evaluation.

5.3.1 Concept 2

Form – The structure of the cards, as presented in Figure 5.4, was not changed. However, a graphic designer devised a new template and icons, based on the list of criteria. Examples from each category are shown in Figure 5.6.
For the purpose of effective communication, information on the cards was kept brief. Since there was not enough space for references and further reading, an additional carrier of knowledge was needed to support the content presented on each card. Therefore, reference to a website to provide additional background information (developed in the third design iteration) was added.
Content – The first-stage elements of the framework were replaced by second-stage elements. On the basis of insights from the cases presented in Chapters 3 and 4, the first category, 'Eye-openers', was completed, and the 'Activities' cards were improved. In addition, a four-page procedure was created, explaining when and where the cards could be used, and proposing a step-by-step procedure to be implemented in a team. This procedure was handed out in the JMP-BoP and DCS evaluations (see Sections 5.3.1 and 5.3.2).





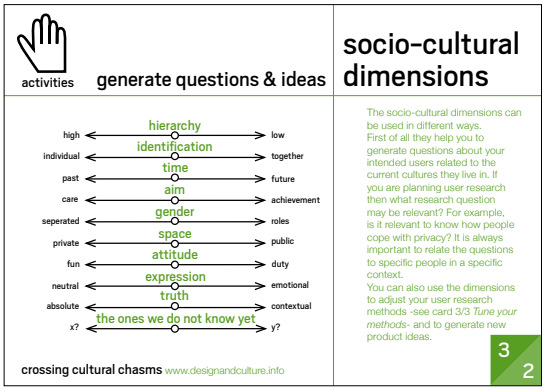


Figure 5.6 Concept 2 – A card (front and back) from each category: Eye-openers, Insights, and Activities

5.3.2 Investigation and evaluation of Concept 2

The design students, together with a graphic designer and a professional designer, evaluated concept 2. The aim of the evaluation was to determine the value of the set for designers. The questions to be answered had to do with how, when, and where they had used the set, and whether there was evidence that the framework had helped designers develop a culture-conscious approach. As a strict validation was difficult because of the many variables that could influence outcomes, a structured and controlled validation was considered: that is, a comparison between design teams that had used the cards and teams that had worked on a similar project (with the same assignment and designers with the same level of knowledge and skills) but without cards. However, the practical reality was that similar teams and projects were difficult to organise in the context of the research. Fortunately, however, some courses were suitable venues to explore a possible application of the cards, and to better understand the usefulness of the set in a design project. Three of the four courses had a high level of realism, because professional clients in a business context had commissioned the projects.
In addition to evaluation in near reality education context, one test was done in reality. A professional designer in an international project also used the cards.

Investigation and evaluation in Joint Master Project-BoP course (JMP-BoP)
In September 2013, five teams of 4-6 students each joined a JMP-BoP.
See Chapter 3 for a description of the course.
Workshop – In the second week, each team was introduced to the card set in a one-hour session. They were asked to read the procedure, which included the selection of three preferred (top-3) cards for each of the three categories (Eye-openers, Insights, and Activities). The selections were recorded and discussed with the researcher. After the session, the students were left alone with the card set to work on their project.
Questionnaire – After finalising their projects in January, all team members received an online questionnaire: some questions were on a six- and seven-point Likert-type scale, and others were open (see Appendix 7). Of the 25 students, 16 responded (64%). A similar evaluation of the card set was conducted with another course. Therefore, we will first look at this course before presenting the insights.

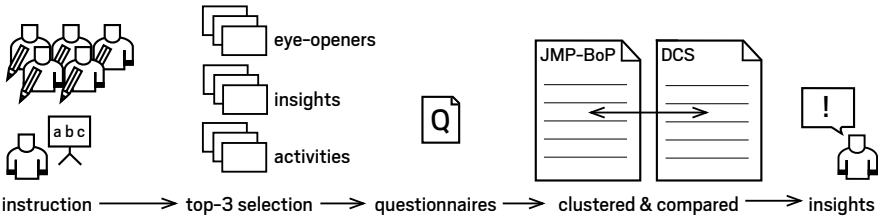


Figure 5.7 Overview of research activities in the JMP-BoP and DCS projects

Investigation and evaluation in Design Culture and Society course (DCS)
In September 2013, students from the IDE master Integrated Product Design attended the Design Culture and Society course, and were introduced to the card set.
Setting – In groups of 4-5 students, each student worked for 40 hours in total, and over a five-week period, on a cultural study, the results of which would contribute to a design project.
Assignment – Each student team were given a design brief by a real client (a company: e.g. from Philips and KLM). After six weeks, the teams had to deliver a report on the cultural study, including the aim, research questions, methods, results, and opportunities for their design project.
Workshop – In the first meeting, 12 teams were given a card set, accompanied by a short instruction. After a brief introduction, six teams were asked to read the cards and the proposed procedure for usage, and to select their top-3 preferences from each category, as in the previously described JMP-BoP cases. The selections were recorded and discussed with the researcher. The whole session took about one-and-a-half hours per team, after which they were left alone with the card set to work on their project. Due to planning issues, the other six teams did not take part in the top-3 selection session.
Questionnaire – On completion of their design project (end of January 2014), each member of the 12 teams received an online questionnaire featuring a seven-point Likert-type scale and open questions (see Appendix 7). Of the 60 students, 11 responded (18%).
Analysis – The top-3 selections were listed in a table, showing the number of times each card was selected. The aim was to see whether one card was preferred over another. The data provided useful insights into how the card set was valued by its users and for what purpose. Students' comments (on open questions) were valuable confirmations of the assessments on the Likert-type scale (for an overview of the research activities, see Figure 5.7).
First outcomes were studied per data set. The positive responses (right side of the Likert-type scale) in two question categories (purpose of use and how valued; see Figure 5.8) were counted per data set (from JMP-BoP and from DCS) and compared with each other. The figure shows percentages of the positive responses, per data set and per question. In addition, the quotes (answers to open questions) were clustered, and a summary of findings was made for each data set, followed by a comparison. Insights across the data were clustered into the earlier mentioned three themes: (1) the specific **meaning** that the cards should evoke for designers, (2) the **content** that should be communicated, and (3) criteria regarding **usability** of the card set.

Two aspects are evident in this figure: (1) the most positive answers came from the JMP-BoP students, and (2) the DCS students did not use the card set other than to generate questions and set up a cultural study (one positive response was for the development of a vision). The insights are reported further and discussed below.

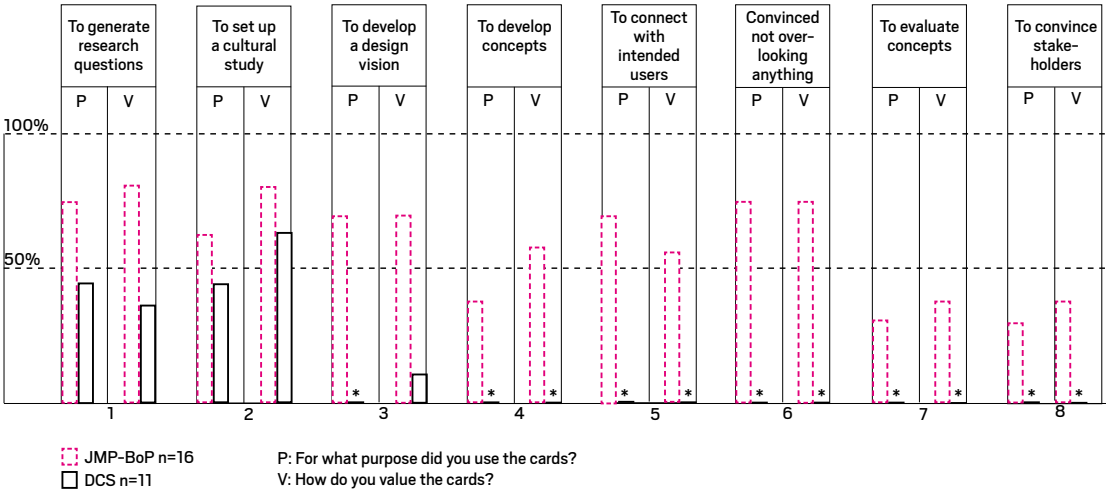


Figure 5.8 Percentages of respondents who answered the questions positively.
*DCS: Design students used the cards only in the very beginning of their projects

Insights from both JMP-BoP and DCS

Content

Framework – The students easily understood the framework, and welcomed it; one stated: *'I especially liked the socio-cultural dimensions cards, because it handed us concrete examples of research methods.'* Obviously, however, the cards were less interesting in projects where aspects other than culture needed closer attention. This was illustrated by the following comments. One DCS student stated: *'If my assignment wasn't so complex, I could focus on going into depth into culture, but I had to bridge over ergonomics and technology to a great extent, and that's not to say that I forgot about culture, but I went with my gut on it'.* Another DCS student observed: *'It could be useful for another project'.* The card set was valued higher in a JMP-BoP context than in a DCS context, as can be seen in Figure 5.8. The BoP designers were likely to be more aware of the need to understand the culture of their intended users. Moreover, they may also be more interested in culture, since – in contrast to the DCS students – they deliberately chose their international project themselves.

Examples – The outcomes show that designers' need to have easily accessible information (see also Usage below). Both DCS and JMP-BoP students expressed their desire to have more examples that illustrated theory. One student said: *'I liked the examples on the back of the cards very much, but in a few cases (when the projects also talked about water) I would have liked to get even more information on these projects.'* The context variety was also appreciated. In answer

to the question as to what students liked about the cards, a student stated: *'The variety of the cards and the extra information on the back of them.'*
Top-3 – The top-3 selection indicated that JMP-BoP and DCS students alike selected the card 'I avoid mismatches' most. Only DCS students also selected the 'I need inspiration and fun' card most often. It is likely that students involved in a BoP project were more focused on solving problems, and so were not thinking about opportunities that cultural diversity could offer. Remarkable is that the spread in selection was wide: nearly all of the cards were chosen at least once.

Usability
When and where – The cards were used to generate culture-specific questions, and to set up the cultural study, especially for BoP projects. For these, the cards were also used to help designers connect with their intended users and to feel confident that they were not neglecting anything. A few students used the cards only to develop a design vision and concepts, to evaluate concepts, and to convince stakeholders. The DCS students did not, however, perhaps because they were unable to understand the benefits or they had – more than in BoP projects – difficulties to select and contact intended users. If they had been given more guidance, they might have seen those possibilities. Thus, more guidance is something to be tested in another development round.
Time – A major issue for users was that in the introduction workshop the time needed to read and to understand the content was short. One student wrote: *'Takes a lot of time to read all of them carefully.'* Users considered that less text per card would be helpful, but should not lead to a superficial understanding and application. This is contrary to other observations that the cards were valued for their compactness correctly. Probably it is mainly the procedure and workshop that cause the feeling of multiplicity of information. Nevertheless, this observation was taken into consideration in the next version of the card set.
Various comments – Positive comments about use of the card set included: *'It was fun to use',* and *'The content is really well presented and understandable, it facilitates the process a lot.'* To the question as to what was liked about the card set, some benefits mentioned by students in BoP projects were: *'Not overlooking things'; 'The variety, so we could use it for inspiration for our culture-related research';* and *'I like the way of using the cards because it provides all the information needed and they can be read fast'.* From students in DCS projects, comments included: *'It was very useful to get an overview of all cultural aspects, this helped to choose directions for the project, and maybe even important, to leave out some directions'; 'Quick generating of questions';* and *'It's organised nicely'.* Thus, these positive comments are examples that indicate the concept develops in the right direction, meeting most of the requirements.
How to use – The suggested procedure (of four pages) was considered to be overly comprehensive and detailed, and the students did not read it right through. Apparently, the procedure was not yet appropriate for everyone. Some comments about what students needed were: *'The chance to see if you can combine the*

cards/methods'; *'It would be nice to give an example of how we could use it during the project'; 'Difficult to decide which ones are most useful';* and *'At the start the cards were very unclear; I think if the explanation were shorter and more clear it would be easier to understand. Maybe the explanation could be visualised?'* The last comment confirms that brief training or an extended introduction will be required for inexperienced users of the tool.

Evaluation in Graduation Project-BoP (GP-BoP)
In September 2013, an SPD master graduation student (see Chapter 3 for a description of the course) started a BoP project. He had heard about the cards from fellow students, and asked to borrow a set to use for his local contextual research in India.
Assignment (project) – A Western start-up company had asked him to develop a business strategy for the introduction of hand-operated washing machines in India. At the start of preparing his research, the student received a few instructions during a short meeting the researcher had with him. He did not receive a procedure for usage of the cards. The design process and results are published in a report (Douma, 2014).
Interview – In January, about three weeks after finalising his research phase, he attended a two-hour semi-structured interview to discuss his experiences with the card set. The first part of the interview dealt with the relevance of the set, and how and when it was used. In the second part, the cards were discussed one at a time, regarding their relevance and how they had been understood.
Analysis – The interview was recorded and transcribed to reread his considerations and compare them with other evaluation results.

Insights from GP-BoP

Meaning
Convincing – In India, the card set was a good thing to fall back on, and also to convince the interpreter that extra research was needed. He stated that a deeper level of doing research was encouraged via the cards. The cards served as boundary objects (Star and Griesemer, 1998), also for the student's Dutch design coaches to explain the contextual research setup. One comment was: *'…and then* [after he had seen the cards] *he* [the interpreter] *was impressed …"those people from Delft, they think about things carefull"…'.*

Content
Completeness – The interviewee was highly positive about the content of the set. It gave him a sense of confidence that he had not overlooked anything. It helped him to reach a deeper level, not giving up too quickly on the contextual research involving intended users. The theory and examples bolstered his conviction that he needed to follow his 'gut feelings' that differences existed that were not easy to extract from interviews, but that were important for his project. The cards helped

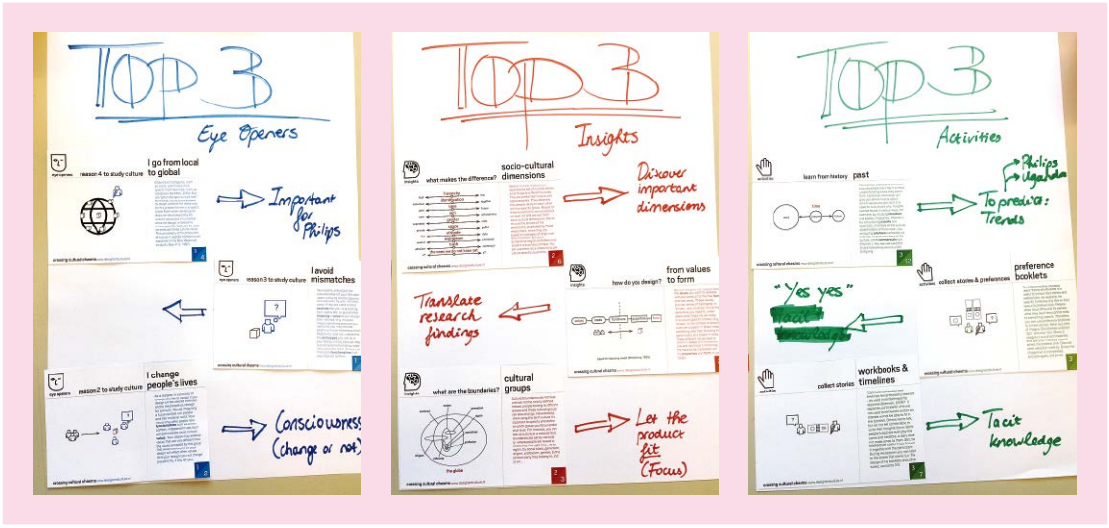


Figure 5.9 An example of a top-3 selection for the development of a research plan in a BoP project

him to elaborate on the values of intended users and to relate them to his own.
Socio-cultural dimensions: – These were very helpful. One comment was: *'…the socio-cultural dimensions were super, super convenient'.* The dimension '*the one we do not know yet.*' stimulates you to think for yourself. *'The fact that the score* (Hofstede's) *is high or low, that does not say much to me … there is more, it's obviously very generalised, and as a designer you have to move away from it'.*
Examples – The importance of the examples was stressed as well. The *'I know my stance'* card that emphasises the need to know your own preferred values to be able to deal with those of others, was considered to be extremely important. The quiz cards were evaluated positively, and more of them would be welcome.
Methods – Although the preference booklet card that shows a method to collect stories about preferences (explained in Dedicated tools, Section 3.5.2) was not used, the student felt it would likely have been helpful.

Usability
When and where – The cards were valuable in assessing the target group and doing consumer research, and in setting up a cultural study. Additionally, the cards were also useful for business stakeholder research, as well as for reflection after the cultural study, and to place, structure, and document findings. Another comment was: *'…it was very convenient to have it very clearly in a row together … that you do not need to search for things'.*
The cards had been developed primarily for a user-centred design approach. Although the student's project was business oriented, nevertheless, and somewhat to his surprise, the student found the card set extremely useful.

Evaluation by Design Practitioner (DP)

A design practitioner with a master and doctoral degree at IDE (Kamp, 2012), applied the socio-cultural dimensions in two international one-day workshops. The workshops were part of a joint research project between Delft University of Technology and the Middle East University of Technology in Ankara, and were commissioned by the Turkije Instituut in the Netherlands. The name of the research project was 'Design for export; similarity and socio-cultural diversity in design'.

Design Approach – The first stage of the workshop consisted of an inventory and selection of the intended users' motivations in a specific situation, using the motivation theory of Ford and Nichols (Ford, 1992; Ford and Nichols, 1987). The second stage was a particularisation to the culture of the intended users, selecting the relevant socio-cultural dimensions, and determining the measure of importance along the poles. Product ideas were generated during the third stage.

Workshop – Two one-day workshops took place in Turkey in January 2014, attended by a Turkish household company, along with twelve Turkish designers and marketers, and a producer of transport vehicles, with six Turkish designers and marketers. The aim of both one-day workshops was to provide the designers and marketers with a theoretical framework and a practical strategy to develop products that were meaningful across cultures. A Dutch senior designer attended each workshop to give feedback on Dutch culture-specific aspects; in addition, two Dutch designers, including the design practitioner (who also developed the design approach), facilitated the workshop.

Research approach – About three weeks after the design workshops, experiences with the card set were discussed in a two-hour interview with the design practitioner (DP) who had developed the design approach and facilitated the workshop. The first part of the interview dealt with the relevance of the card set and how and when it had been used. In the second part of the interview, the cards were discussed one at a time, as to their relevance and how they had been understood.

Analysis – The interview was recorded and transcribed to reread her considerations and compare them with other evaluation results.

Insights from DP

Meaning

Socio-cultural dimensions – The socio-cultural dimensions, text and arrows with a 'sliding dot', were presented to the participants, including the explanatory text, without the associated cards. The DP preferred not to show the examples on the cards, in order to encourage participants to think with open minds. The DP mentioned that the representation of the preferred value on each dimension, with the 'sliding dot' in the middle, could be interpreted as if the dimension were not important, whereas it could still be very important to balance the value on this

specific dimension. If workshop participants had used the cards with the examples as well, this issue could then have been solved. This indicates the importance of the manner of representation of the model and the importance of the provision of application examples.
Boundary object – An interesting insight was that the more abstract approach – going from values to form rather than directly to form, which the designers tended to do – was aligning with the interests of the marketers. The socio-cultural dimensions helped to bridge a gap between the marketers and the designers, and thus worked well as a boundary object. Not only the form – cards that can easily be shared – serve as boundary objects, but also the content (elements of the framework) do.

Content
Design space – The socio-cultural dimensions were understood and able to be used as intended. Starting on an abstract level – with the motivation theory and socio-cultural dimensions – helped participants to think and discuss at a high level, rather than thinking directly in terms of form and functions. As a result, this opened up the design space.
Values – The interviewed DP stated that the design solutions could still be the same for both the Turkish and the Dutch culture, although the underlying values would become clear with the help of the dimensions. For example, in the transport project, the goal was to devise bus transport solutions for children. A webcam solution supported the shared aim: safer transport for children in the Netherlands as well as in Turkey. For the Turkish situation, the underlying value had to do with Turkish parents feeling strongly about needing to be able to follow their child closely, whereas for the Dutch situation, the underlying value involved the child's independence and individuality: namely, parents being able to let the child travel independently. Due to the fact that the shared value 'security' has slightly different emphasis, these differences could lead to different product ideas.

Usability
Boundaries – The DP stated that it was important to define the boundaries of the cultural group where the socio-cultural dimensions were applied. For example, there is a difference between looking at the socio-cultural dimensions from the perspective of the children in the bus or from the perspective of their parents; gender roles may not be an issue for the children, but they may well be for their parents.
Conclusion – The DP concluded that the socio-cultural dimensions together with the entire set of cards were highly useful for designers. However, in the context of the workshops, the effort needed to study the content was considered to be too heavy, given the limited time available. An introduction course lasting at least one day would be needed in order to conduct targeted research regarding proper use of the socio-cultural dimensions.

Ideas for improvement – Finally, the interviewee suggested that it would be very useful to develop a mobile application for designers, with the possibility of storing pictures along with matching examples.

Evaluation and investigation by a Graphic Designer (GP)
An experienced designer with a master degree at IDE, working both as a graphic and a product designer (van Huystee, 2014) evaluated the form of the cards. He considered that there was too much visual information on the back, and the quality of the pictures was too low. He designed three alternative versions: one with hand-drawn visuals, and two with real-life pictures (one in full colour and the other in black-and-white), less detailed than the ones in Concept 2. Together with another product designer, we selected the black-and-white version for improvement of Concept 2 (see Final Design). The assumption was that pictures of real people and products would stimulate empathy among users of the cards (Sleeswijk Visser and Stappers, 2007). The pictures show just enough details to inspire, and to help users remember the text (mnemonic device; see Appendix 3 Card Set: design criteria).

5.3.3 Discussion and conclusions

In this section, Concept 2 has been presented and evaluated. From the various evaluations, we were able to obtain a clearer picture of the value that designers had placed on the card set: when, where, and how it could be used, and what should be developed further. The findings were summarised as follows:

Meaning
Target users – The value of the card set was clear for designers engaged in international projects where culture could be approached on a national level. These designers understood that they were outsiders, and therefore they understood easily the relevance of the card set. This made sense, because the theory applied in the card set came mainly from studies of national cultures. Nevertheless, the investigations in Chapters 4 and 5 demonstrated that the cards were also relevant within countries and were closer to the designer's own culture. For those designers who were not aware of being outsiders, more training would be needed to explain the relevance of the card set.
Boundary object – The strength of the cards was that they served as boundary objects in teams and with between stakeholders. This was exceedingly useful for designers, who usually work in an interdisciplinary manner. The set also contributed to the credibility of doing cultural research in a design setting.
Confidence and Completeness – The card set inspired confidence in the designers, doing away with a sense of insecurity about possible biases regarding their intended users. It gave designers a sense of satisfaction, a feeling of certainty that nothing had been overlooked. This was a major selling point, because the designers had little time and financial support to carry out research.

Form – The set had a professional appearance, but could be improved by reducing some of the information on the back of the cards, and improving the quality of the photos.
The Final Design includes these improvements.

Content
The content was well understood, and the importance of and need for more resources and examples was clear. However, the extent of the material conflicted with the amount of time that designers wanted to spend reading. Therefore, it would be useful to have another source of information for those who might be interested in a deeper level of knowledge. A website or mobile application would be suitable forms, and could also be applied to support the information with references. Therefore, the Final Design includes a website.

Usability
The relevance of the card set was clear in terms of generating questions, setting up and conducting a cultural study, and – to a lesser extent – developing a vision and concepts, and evaluating concepts.
The manner in which the card set could be used needed to be explored and developed further. The way that was described in the procedure, which proposed making top-3 selections within a design team, worked well. The selection helped the designers to discuss the relevant aspects of culture in their design, to generate research questions, and to prepare a cultural study. The other procedure was proposed by the design practitioner: namely, to apply socio-cultural dimensions immediately after a first analysis of the user context from a universal perspective. This seemed to be a promising approach, but it called for further research.

5.3.4 Five intentions regarding a culture-conscious approach to design

The evaluation of the cards' usability, together with all current insights, resulted in the question as to what reasons designers might have for studying the culture of their intended users, and therefore for using the cards. The reasons likely to influence the chosen direction are suggested in the card set's 'Eye-openers' category, based on the assignment and the findings in Chapter 3, such as the interests of the stakeholders and the need to avoid mismatches. For the various underlying reasons, five design intentions – the specific reasons for following a culture-conscious approach to design – could be identified. The first two are to affirm a culture and to become attuned to it. Here, the cultural values of intended users is approached as an accepted situation. The next two intentions involve changing a culture and bridging two or more. These are connected with the growing attention being paid to behavioural change within the design research discipline. The last intention is to consciously bypass cultural values as an area of interest to study, either because the designer is looking for universal solutions, or the assignment calls for a technical or other focus. Depending on the assignment,

Designer's intentions	Designer's considerations
1. Affirm a culture	How can existing values be affirmed by design?
2. Tune with a culture	How can mismatches between the design and the cultral group be avoided?
3. Change a culture	How can existing cultural values be changed by design?
4. Bridge cultures	How can different cultural values be bridged by design?
5. Bypass cultural aspects	Other focus.

Figure 5.10 Five design intentions regarding a culture-conscious approach to design, illustrated with examples of a designer's considerations

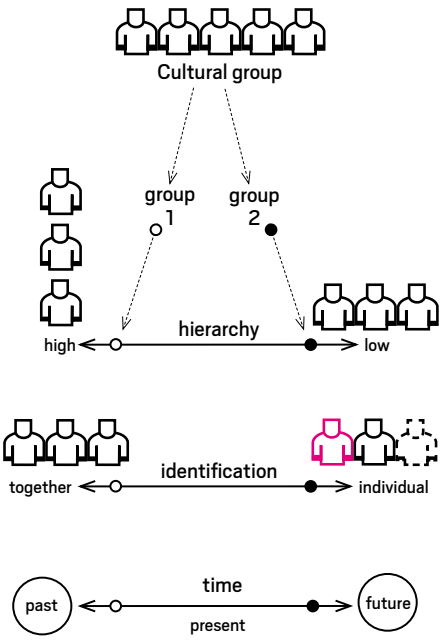


Figure 5.11 Two cultural groups

the designer can make a conscious choice of direction. The five intentions are explained below, and include examples, albeit hypothetical ones. They may be superficial, but illustrate the designer's reasoning, along with questions the designer wishes to answer.

For each design intention, four characteristics of the situation described are envisioned: the cultural group or groups in a specific context; the design assignment; the intention of the designer; and the designer's considerations. Together they illustrate that the different intentions with respect to taking culture into account lead to diverse considerations, and consequently to different designs. Together with an example of a designer's consideration, each intention is illustrated in Figure 5.10.

The socio-cultural dimensions typify two cultures. The cultures are used in order to illustrate the five intentions. They are visualized in Figure 5.11 and explained below.

Cultural group 1 – The envisioned cultural group – in a specific context of time and place – is typified by the following characteristics: the notion of hierarchy is strong (group members accept unequal distributed power), identity is focused on that of the group (together) rather than on the individual, and the group members are oriented to the past, and feel connected to their heritage.

Cultural group 2 – The envisioned cultural group – in a specific context of time and place – is typified by the following characteristics: the notion of hierarchy is strong (group members embrace equal power division), identity is focused on that of the individual rather than on the group (together), and group members are oriented to the future, embracing those things that are new.

Design assignment – Each intention will be explained with an example of a design assignment that best illustrates the intention.

1 Affirm

This intention focuses on the affirmation of existing cultural values of the group in question. The designer looks at how she or he can enhance and affirm the culture of his/her intended users: for example, the design strengthens the culture's identity, and consequently gives its members a sense of belonging.

If the assignment is to design a dinner event for cultural group 1, questions for the designer to consider might be in regard to:
Hierarchy – How can the notion of hierarchy be communicated to the group members? For example, by using chairs of different sizes (e.g. lower or higher/ smaller or larger), or by varying the table decorations to distinguish hierarchy-related positions.
Identification – How can the importance of the group rather than the individual be affirmed? For example, by designing the possibility of eating from one large bowl or pot (or from another object that invites sharing).
Time – How can the dinner event connect to what people recognise and value from the past? For example, the designer could apply traditional archetypal ornamentation, or use other forms and properties that group members are able to recognise from their traditional past.

2 Tune

This intention focuses on the attempt to be in tune with existing cultural values in order to achieve an optimal design and to avoid mismatches between the cultural group and the product. The designer remains alert to the possibility of misinterpretations by checking the perception of forms and functions.
The designer's goal is to avoid possible mismatches, and indeed, this intention was evident in most of the cases (see Section 4.4).

For the same dinner event for cultural group 1, questions that might be considered are:
Hierarchy – How is the proposed design in tune with the preferences of authorities? Does it match with the status of the most powerful person in the group? For example, the application of recycled wood with traces of its first life could be interpreted as being associated with poor people, and therefore not acceptable for the most powerful person in the group.
Identification – Do the group members accept differences? For example, if the design includes different positions around a table, each with a different colour and style, the group members might feel uncomfortable choosing a seat.
Time – Is the design Most Advanced and Yet Acceptable? To what extent are forms and properties familiar to members of the cultural group? This past-oriented culture may be slow to embrace new and unknown products. The questions are focused more on checkpoints to avoid mismatches than to affirm or change the existing culture.

3 Change

The third intention focuses on changing a cultural value. For example, the designer aims to shift the notion of hierarchy among group members. An example of a BoP project [case 3.14] in which the design student intended to change the social role of women is described earlier in this section.

If the assignment is to design a dinner event for cultural group 1, questions that might be considered are:
Hierarchy – How can hierarchical distinctions between members of the group be avoided? For example, a round table does not support the notion of any one person needing to be seated at the head of the table.
Identification – How can personal expression during the dinner event be stimulated? For example, the form and properties of the chairs could force each member of the group to sit in a different manner.
Time – How can the dinner event inspire group members to change it in some way? For example, by including functions which add an important value to the occasion.

4 Bridge

This intention focuses on bridging different cultures by means of design. For example, the European flag and the anthem ('Ode an die Freude', based on the last movement of Beethoven's 9th Symphony, composed in 1823) are two symbols introduced as an attempt to unite different cultures, grouped by nation. It is not a strong solution, however, because the symbols do not seem to be based on the different cultural values that need to be united. Especially in those public spaces where cultures converge, there are many occasions for designers to bridge cultures through design.

If the assignment is to design a dinner event for cultural group 1 and group 2 together, with the aim of bridging these two cultures, questions for the designer to consider might be:
Hierarchy – How can the most powerful person be recognised in a subtle way? For example, lacking a 'head of the table' position, a round table is a subtle form of detail that indicates the absence of a specific position.
Identification – How can the design enhance individual expression combined with a collective feeling of sharing? For example, the design offers the possibility of choosing a specific seat (each seat is different, but no chair can be valued as more important than the others) positioned around a round table.
Time – How can the design refer to both tradition and modernity? For example, by combining traditional decorative details with a geometric basic modern form, or by choosing a traditional archetype combined with modern materials.

An example from practice is described in Figure 5.12.

A Dutch coordinator of international projects bridged the cultural gap by way of her design. She had experienced the fact that, in several countries, recipients of a gift from her did not unwrap it in her presence. Thus, she missed the pleasure of explaining the gift and sharing her thoughts about it, whereas it was the receivers' custom not to unwrap the present in order to avoid emotional expressions, thereby protecting the mutual harmony. The solution was to wrap the gift in transparent cellophane; thus, the receiver did not need to unwrap the item in order to see it, and at the same time, the woman was able to converse with the recipient about the gift.

Reported by Malinda Twaalfhoven

Figure 5.12 Transparent packaging to bridge the gap

5 Bypass
The fifth and last direction is to circumvent cultural values: for example, simply because stakeholders' priorities are different. For instance, as in the case involving the better brace, mentioned in Chapter 3 [case 3.7], priority was given to ergonomics and production aspects. Though all five directions were considered, the choice in the end was not to focus on culture-specific aspects in the design process.

These five intentions with illustrative examples are added to the set of cards and evaluated in the design practice.

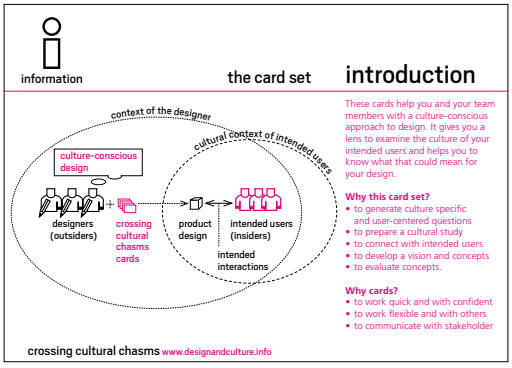
the tool: 3 categories + content

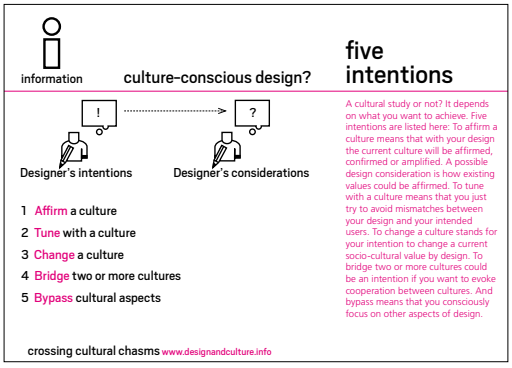
Why? Designers' reasons for studying culture	Card	What? Designers' knowledge relating to the study of culture	Card	How? Designers' activities relating to the study of culture	Card
To avoid blind spots and more		A lens to look at culture in the context of a design project		Methods, tools and tips to examine the cultures of the intended users	
To know one's own personal and cultural values in order to deal with external influences	1.1	Distinctions of designers' concerns (reasoning model)	2.1	Set boundaries, determine the cultural group	3.1
To avoid mismatches between product and users	1.2	Distinctions between personality, culture and human nature (definition of culture)	2.2	Generate culture specific questions and ideas (socio-cultural dimensions and onion model)	3.2
To affirm the cultural group	1.3	The importance of boundaries relating to the cultural group	2.3	Sensitise regarding other cultures (onion model)	3.3
To change a culture	1.4	Values: cultural values and practices	2.4	Tune participatory methods	3.4
To go from local to global designs or vice versa (to bridge cultures)	1.5	Morality and culture	2.5	Compare cultures	3.5
To generate new ideas (cultural differences as asource of inspiration)	1.6	Socio-cultural dimensions to generate culture-specific questions, to analyse and synthesise	2.6	Use dedicated tools	
To rethink local values, which opens up the design space	1.7	Hierarchy	2.7	Preference booklets	3.6
To bridge cultural chasms in participa-tory sessions	1.8	Identification	2.8	Cards	3.7
To understand the meaning of desktop findings for a specific culture	1.9	Time	2.9	Workbooks and timelines	3.8
To avoid a culture shock	1.10	Aim	2.10	Use a variety of tools to collect stories	
Three reasons to overlook culture		Gender	2.11	Observations	3.9
Other focus	1.11	Space	2.12	Interviews	3.10
Blind spots	1.12	Attitude	2.13	3D-models	3.11
Not equipped	1.13	Expression	2.14	Photo-elicitation	3.12
Three quiz cards	1.14	Truth	2.15	Product confrontation	3.13
	1.15	The designer's concerns	2.16	Role-playing	3.14
	1.16			Learn from the past	3.15
				Ask permission, be attentive to reciprocity and manage expectation of intended users	3.16

Figure 5.13 Overview of the content for the cards

5.4 Final Design

This last section presents the Final Design of the card set, and the Crossing Cultural Chasms website: www.designandculture.info. Mainly, the graphics have been improved, and some of the text has been corrected and fine-tuned. An introduction card has replaced the usage procedure, which was overly comprehensive and detailed. Because the students did not read the entire procedure, it was decided to provide a quick start 'possible procedure'.
An overview of the content is given in Figure 5.13, followed by card examples (Figure 5.14, 5.15, 5.16, 5.17) and the home page of the website (Figure 5.18), and one of the card categories on the website (Figure 5.19). The website includes all the cards, references, and further reading, along with space for extra findings, such as examples from the design practice.
The content of the cards is based on insights explained in Chapter 2, 3 and 4. For the sake of the consistency each category has an equal number of cards. Therefore, to the category Eye-openers four cards are added; Three quiz cards to sensitize designers for culture in design and one card on culture shock.





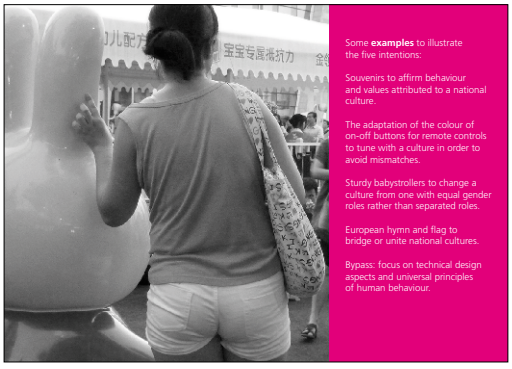


Figure 5.14 Introduction cards

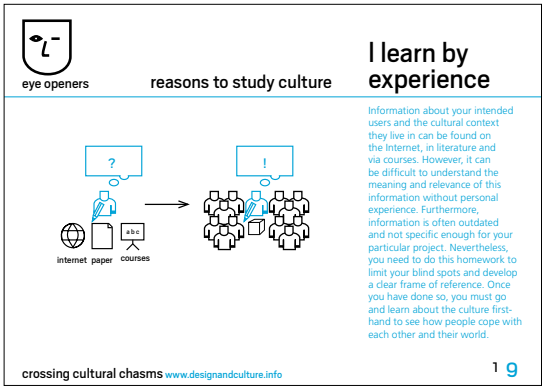
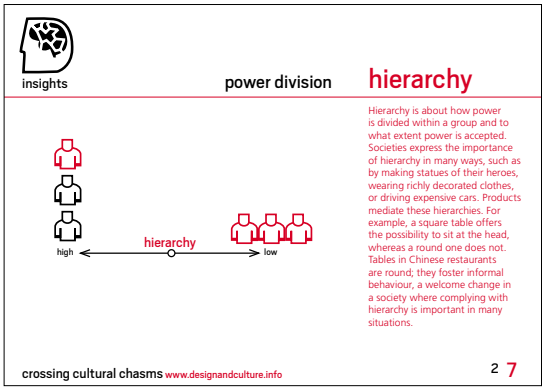


Figure 5.15 A card from the Eye-openers category



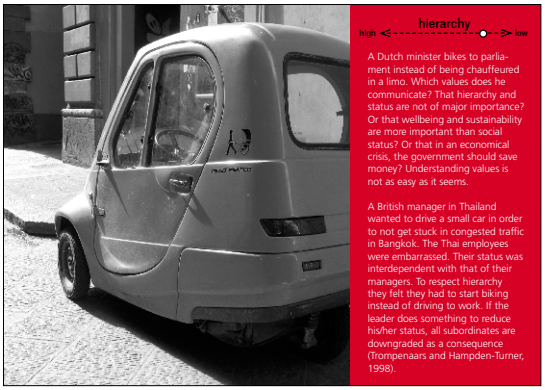


Figure 5.16 A card from the Insights category

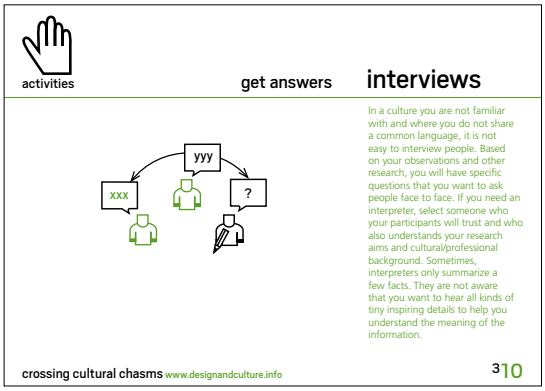


Figure 5.17 A card from the Activities category

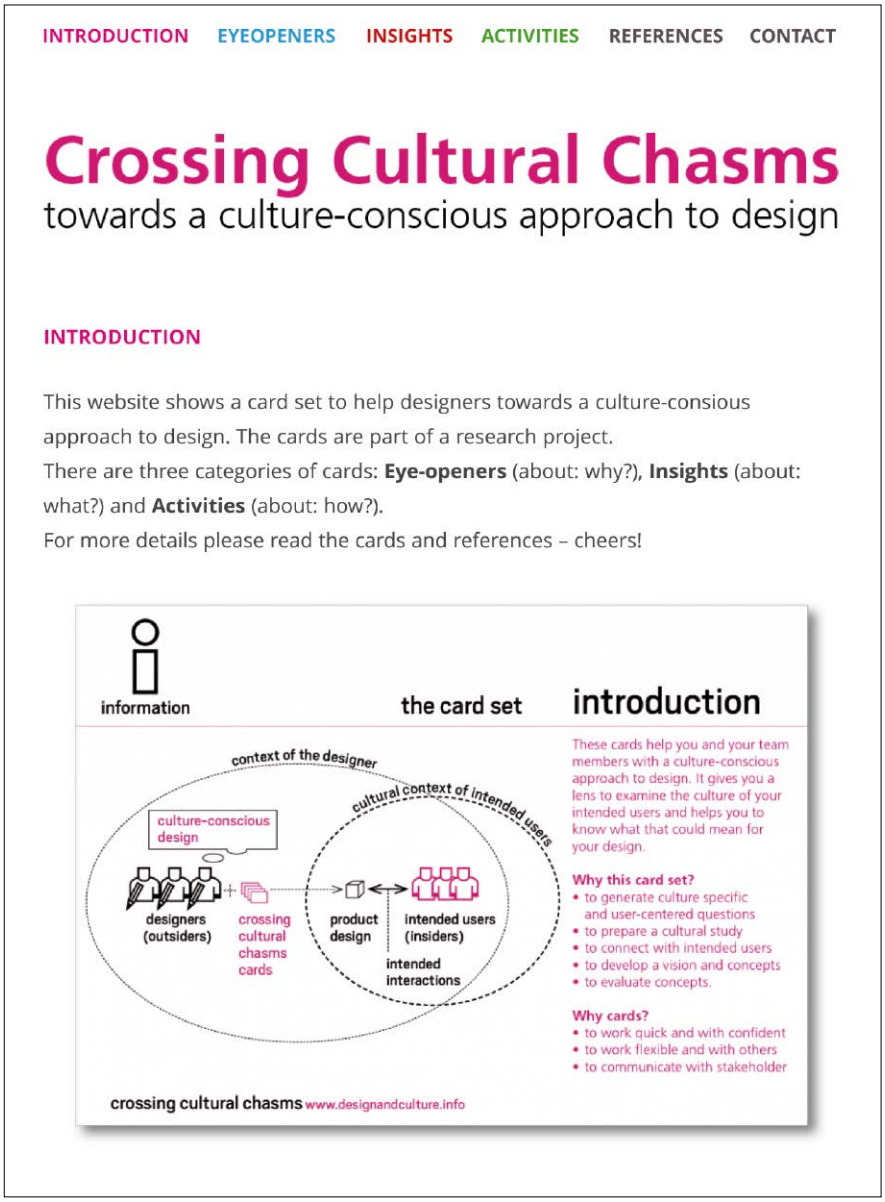


Figure 5.18 Home page of the website

Figure 5.19 The Eye-openers cards on the gallery page of the website

5.5 Discussion and conclusions

This chapter described in brief the design process regarding the card set.
As stated earlier, this thesis does not present all of the research chronologically. Here, we focus mainly on the design of the card set as a tool to support designers rather than as a means to underpin the research. In reality, the card set was developed simultaneously with the studies presented in Chapters 3 and 4.

The question that needed to be answered in this chapter was:
How does the tool help designers who are engaged in a project in which they are unfamiliar with the culture of their intended users?

A fortunate conclusion is that the generally positive response to the card set confirms its utility value in relation to culture-conscious design. The positive responses regarding the set's content confirm that the insights (explained in Chapter 3 and 4) are useful for designers, and the form of the card set meets the criteria listed in Appendix 3.
An interesting insight is that the cards are considered useful not only to generate questions and to set up a cultural study but also to serve as boundary objects, connecting stakeholders from different disciplines and cultural backgrounds. Furthermore, the cards enhance a feeling of satisfaction and confidence that nothing has been overlooked. At the same time, it can be concluded that among designers there is a pressing need for more information and examples of how to apply the socio-cultural dimensions. To this end, the website has been developed to expand the card collection, but extra training will be required to demonstrate all of the cards' possibilities: for example, to use them in a generative way as well, and especially in a non-BoP context to focus on culture as a variable of intended user groups.

The Final Design – card set and website – has not been evaluated for this thesis.[15] An eventual evaluation will need to focus on how the cards are used, and to explore how the set, and consequently a cultural study, can be incorporated into a broader design process. The design workshop in Turkey provided a good opportunity to link culture-specific aspects to universal ones, moving from universal theory about emotions to culture-specific values. However, other possibilities need to be looked at in more detail. Preferably, these studies would be carried out in a professional design context and include international projects. An evaluation involving design practitioners – other than the novice designers used mainly for the studies in this thesis – would be needed in order to understand more completely the benefits of the user-centred and culture-specific approach that is proposed with this card set.

[15] The content for the Final Design has not substantially changed.

C6 What we have now

Contribution to design theory, future research, design education, and design practice

As we have now established an understanding of the concept of culture in the context of design, a general discussion will highlight the value of the findings. This chapter commences with reflections on the research question and research approach, including observations regarding a possible research direction in the future. The chapter concludes with a look at the possible implications of the findings for design education, with a final reflection on the culture-related questions in my personal design practice, asked in Chapter 1.

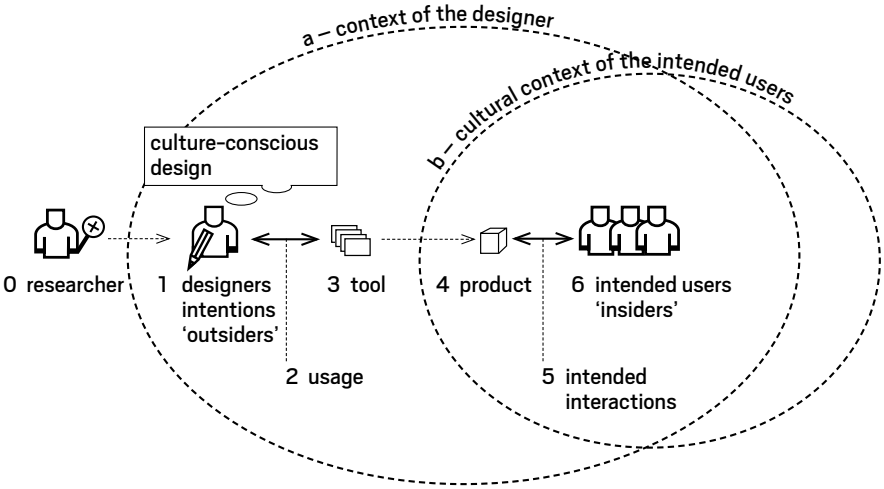


Figure 6.1 Overview of the research components (see Figure 1.12)

6.1 Reflection on the main research question – Value of the findings

This section includes observations on how the findings contribute to the theory and the practice of design. They concern questions that have been answered, that remain unanswered, and that have newly arisen.

The research aim was: *to help designers who are engaged in a project in which they are unfamiliar with the culture of their intended users.*
The research questions regarding the aim of this research were: *What do designers need in a project in which they are unfamiliar with the culture of their intended users. What are cultural barriers they encounter and what opportunities are there to support them?*
First of all, a lens and a perspective to examine culture were needed. To know by what means designers could be helped, we had to ascertain the cultural barriers they encountered. Therefore, we first had to determine what obstacles they experienced and subsequently distinguish to what extent these barriers were

based on differences between cultures. At the same time, we wanted to know how designers handled these barriers, and how they could be supported in either avoiding or making use of them. Finally, because we wanted to help designers not only on the basis of what they perceived as barriers and opportunities, we investigated additional design opportunities regarding cultural values.

In the course of the research, it became clear that the concept of culture is highly complex, since it is place, and is context specific in time and influenced by a large array of factors. Furthermore, it is very difficult to delineate a cultural group. Initially, Hofstede's model seemed adequate to help these designers distinguish cultural values and practices, but it was gradually found to be problematic. Current frameworks simply do not meet designers' needs. The research showed that the type of framework necessary was one that would be responsive to the way designers think. For example, it should tune with designers being future oriented and concerned with changing and dynamic situations. In addition to being future oriented and application driven, the intended users of the tool (designers) view their intended users in different ways; as universal human beings, as members of groups, and as individual persons, and they do not approach these perspectives separated, but intertwined.
During the study, we found various barriers that designers encountered when designing for cultures with which they were not familiar. We also distinguished diverse ways to handle these obstacles. The research described here confirms that there are various compelling reasons for supporting designers in the area of culture-conscious design. The most important barriers have been identified, but it is likely that the list is not complete. First of all, the focus of the research was on the perspective of the designers and their experiences. In the studied cases, there may be undetected barriers that could have been identified if the research had shifted to the perspective of the intended users as well. Thus, we do not know whether we overlooked significant barriers. As a matter of fact, the research was centred on the designer, and it contributes mainly to their awareness of the culture of their intended users. To date, the tool seems to be a good means of achieving the goal, which is *to help designers who are engaged in a project in which they are unfamiliar with the culture of their intended users.* However, during the investigation, doubts, questions, and constraints also emerged. These will be discussed further in the following sections.

6.1.1 Framework

The vast number of theories about culture and cultural values indicates that there is no coherent way to frame it. Especially in the design domain, which is adjacent to and borrows theories from many disciplines, it is impossible to make an unambiguous statement about culture, because numerous variables play a role. However, this does not mean that we should leave designers unsupported. As the research progressed, it became increasingly clear that our designers require a framework of their own to serve as a fine-tuned lens to examine the culture of

their intended users. The aim was not to end up with a framework that covered all cultural aspects relevant for the design discipline, but to expose potential blind spots regarding intended users' cultural values. This involved taking into consideration and indicating directions about how designers could act upon relevant cultural differences. For example, the socio-cultural dimensions helped them to tune research methods, such as participatory sessions, for their field studies. An awareness of culture-specific values makes it possible to rethink these, and consequently to extend the design solution space. Like other theories about culture, the framework has its own purpose and context, and therefore it is specific to the discipline of design.

The strength of the framework is that although it is abstract, it is concrete enough to serve as a lens to examine intended users' cultural values; moreover, rethinking social values that are specific for a cultural group opens up the design space. For example, begging in the street can be seen as shameful in Dutch culture, and something that should not be encouraged. However, if designers examine their own values and accept that individual begging is morally correct – for instance, similar to the way we view door-to-door collectors for charity, street campaigns, or begging by monks – they could come up with new possibilities, such as designs that make begging less humiliating for the person in question, and perhaps more comfortable or even fun. An unexpected advantage of reasoning with the socio-cultural dimensions from value to form, rather than starting from functions, is that the level of abstraction and jargon resonates with

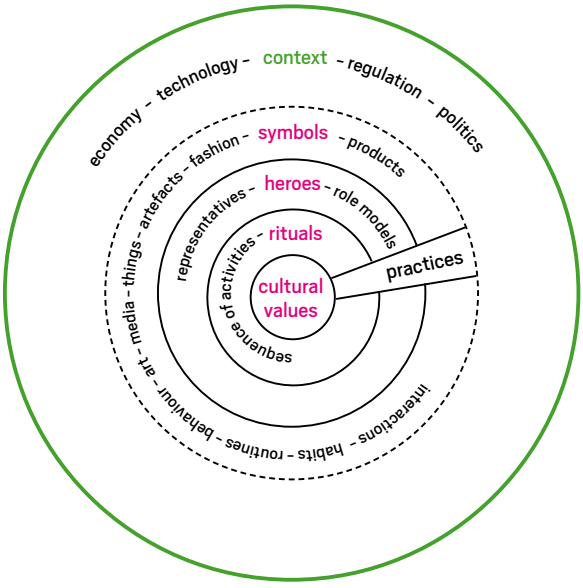


Figure 6.2 The onion model with an extra layer comprising contextual factors

and is familiar to certain other disciplines. Together with the tool, the framework could serve as a boundary object (Section 5.3.2). This is advantageous, as designers work with multiple disciplines (the boundaries).

A weakness of the framework is that it involves only the shared values of groups regarding their ways of interacting with each other, and excludes contextual factors that might influence these values, such as economy, technology, and politics. Indeed, modern culture cannot be understood without taking into account the role of science and technology (Bijker, 1995). An extra and outer layer of the onion model could represent these contextual factors, as suggested in one of the cases [3.11], and as visualised in Figure 6.2.

Another weakness or limitation of the framework is that it does not help in terms of the dynamics of cultural processes, such as representation, regulation, and identity, as described by the Circuit of Culture (du Gay et al., 2004), as already explained in Chapter 2. Actually, we have only used a section of the full process, which are consumption and production, as indicated in Figure 6.3.

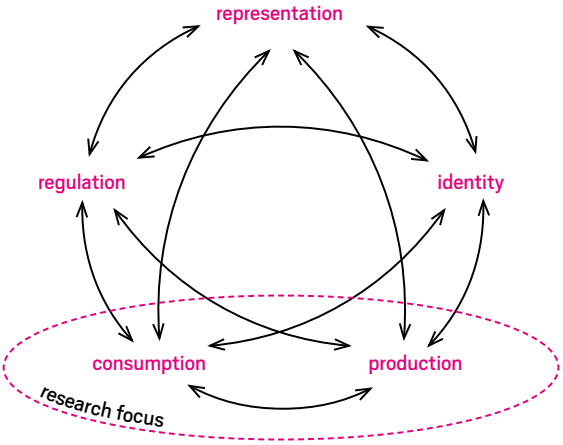


Figure 6.3 The Circuit of Culture (based on Du Gay et al., 1998), indicating the research focus for this thesis

A more complete model for designers could be one that comprises the framework together with the processes. The framework then provides the lens (how to look) and the processes (where to look). The model could help designers not only to examine their intended users' cultural values but also the processes that influence the meaning these products have for these users. For example, the model would then deal with an important process such as representation, the influence of which increases enormously by developments in the field of the Internet.
The question is whether such a model, used in the context of a design project,

is too complex and surpasses its purpose. However, designers could benefit from it at least in an educational context.
Recently, approximately 120 master design students used the CoC model for their cultural study in their design projects. Provided that a number of adjustments, to appropriate the model to designers, are taken into consideration, an evaluation demonstrates that this model is helpful for designers embarking on a cultural study in the context of a design project (van Boeijen, 2014).

Another aspect of the framework that needs some more investigation is the dichotomy of the socio-cultural dimensions. This bi-polar representation of the dimensions might still lead to superficial interpretations and generalisation, and thus used by designers in an unintended way. Section 6.2.2 will further elaborate on this issue.

6.1.2 Tool – The Crossing Cultural Chasms Card Set

The content of the cards, described in some detail in the previous chapter, represents most of the research findings for this thesis. The limited space on the cards helped the researcher to focus on and to capture the essence of what our designers require in order to examine the culture of their intended users.
The evaluation of Concept 2 of the card set, described in Chapter 5, shows that the cards have an added value when designers are in the position of being outsiders and are not familiar with the culture of their intended users. The cards help to limit blind spots, providing a sense of satisfaction and helping designers feel confident that they are not overlooking anything. Furthermore, as previously mentioned, the cards could serve as boundary objects with other disciplines, and contribute to the credibility of the designers' work in the eyes of stakeholders and intended users.
In particular, those Western designers working on a project in and for a non-Western country recognise the relevance of the cards. Designers involved in a project for intended users whose culture seems to be close to that of the designers – for example, Dutch female designers designing for European women – do not as easily recognise the relevance, because on a certain level they belong to that culture. A reason could be that they need to make a greater effort to delineate the cultural group and to get in touch with their intended users. They need more examples and training in terms of how they might apply the cards in those situations.

A limitation of the cards is that they do not explicitly involve the designer's own cultural and personal values. The cards read as a one-way direction to support designers with their international work. The designers and their work are given as a starting point without questioning it in ethical terms. Initially these international projects were selected because the big contrast helped to identify potential cultural barriers. The cards are developed in a specific reality that is of the designer and researcher as defined in this thesis. The primary aim of the cards is

to help these designers to become *aware* of culture in a design project rather than to give them an answer on what they should do or not with this awareness. In that respect the aim is more process oriented than content. However, the cards are (and cannot be) value free. It is inevitable that with the cards, the kind of examples, the chosen words (language), and the selected images, cultural and personal values will be communicated. And consequently these values can be questioned from an ethical perspective. The content does not give designers a helping hand if they are confronted with conflicting values (for example, between the designer's values and the values of their intended users or between various social groups they are designing for). For a more complete understanding of cultural change one should know more about the ethical dilemmas in intercultural interventions. For example, with the aid of the assessment criteria represented by Gullestrup (2006). Furthermore, they do not give directions for how to delineate the cultural group. One of the answers could be the snowball method, as described by Bijker (2003, p.46).
These found limitations raise questions that will lead to further studies that are discussed in Section 6.2.2.

The framework and cards have not yet been tested in the design practice. Remaining questions have to do with how experienced designers in international projects can benefit from the card set, and how it can be used within their design process.

6.1.3 Additional insights

The research described in this thesis was a journey, the goal of which was to determine the concept of culture in the context of the design discipline. The broad approach – in the first instance a bottom-up method, based on personal experiences in the international professional design practice – resulted in a copious amount of data, enriched with observations made by design students about their experiences. When the data were scrutinised, new opportunities for designers could be detected. These possibilities are discussed below.

Time orientation

Remarkable is that most of the design research involving the studied cases focused on current cultural practices of intended users. The designers learned about the culture simply by travelling to the location, observing, and taking part in sessions with intended users. Much less attention seemed to be paid to examining the past in order to understand the intended users' frame of reference: for example, by reading books, consulting experts about history, making historical analyses of artefacts and commercials, and so on. This situation might be due to our design education, in which considerable attention is given to participatory sessions, as well as to co-design, which is centred on present daily practices. This is also typical for the design discipline, which is oriented to the future. In the literature involving culture, we have seen that the orientation is different with regard to

time. Designers could benefit from insights from history, as old values and customs do not necessarily need to be 'thrown out with the bath water'. In some instances, these insights could lead to bigger solution spaces. For example, if sharing products is a dominant cultural value, designers could think in terms of improving and enhancing this sharing in such a way that it also enhances the quality of individual experiences.

Cultural change

Another underexposed aspect in the studied cases, seen especially in the BoP cases, was the discussion among designers about cultural change. When it came to culture, the designers concentrated mainly on product acceptance: namely, avoiding mismatches rather than considering possible the cultural impact of their design. However, designers are trained to transform current situations into new ones; their interventions have an impact not only on the level of comfort of individuals but also on how people interact with each other in a group. The question arises as to whether cultural values can be changed by design. Hofstede argues that values do not change easily by way of new technology and products (cause and effect). *'If young Turks drink Coca-Cola, this does not necessarily affect their attitude toward authority'* (Hofstede, 2005, p.12). The Circuit of Culture model (du Gay et al., 2004) also shows the limited influence of designers on cultural change. The designer who is part of the cultural process 'production' is just a tiny link in the five cultural processes described in their model. However, many examples illustrate that products mediate social processes, and consequently culture-specific values as well. For example, how cultures value the importance of individual expression is to a certain extent correlated with economical growth (Inglehart and Baker, 2007). Products such as computers and smart phones support this individuality. Without understanding precisely the relationship between the cause and effect of cultural change, it is still an important focus for the designer. For example, a designer could have the intention of changing how people in society think about gender and baby care. The design of a sporty and cool-looking baby-stroller might induce men – who otherwise preferred separate gender roles with regard to baby care – to accept that such a role need not be reserved only for women. The robust stroller has a mediating role in terms of how one perceives the division of gender roles. Another example involves BoP projects. In these projects, the general aim is to change the living circumstances of impoverished people, by way of new business concepts and product service systems. If these changes have an impact on society, it is important to understand the current cultural context in order to know which socio-cultural values need to be protected, and which older values might be subject to change or adaptation. In that respect we can still learn from the old example of the Ibieca story; about the social impact of the introduction of the washing machine that replaced the village washing basin, which unwittingly changed the social structure of the village women's relationships (Harding, 1984).

6.2 Reflection on the research approach

The research described in this thesis was a quest, the motivation for which derived from my own experiences with design and design practices on an international level. It was a form of practice-based and experiential learning, driven by a desire to find answers regarding the role of culture in design. Furthermore, I felt challenged to create order and meaning from the chaos of how people were accustomed to speaking about culture, and to bridge cultures by means of design. The culture in which I was raised, and those in which I have lived up until now (dominated by a modern industrial-technological culture), influenced this research. I have sought to avoid biases by constantly examining insights from different angles and perspectives, and by involving other researchers as much as possible, like with the Stage A research related to the nine papers presented in Chapter 3 (Figure 3.3). Nonetheless, it is impossible to undertake research that is entirely value free, incorporating all the different perspectives on 'what is good research'. If we did not follow our own values and beliefs, we would lose sight of our goals, and would lack the motivation to bring any research to a fruitful close. We need values simply to help us to choose our direction. An approach that could have helped to make my individual perspective and the one in the context of education more explicit could be Critical Praxis Research (Kress, 2011).

6.2.1 Limitations

The linear form of this thesis, with its clear beginning and end, suggests that the study has been a systematic and organised process. However, empirical reality has taught that the process of finding answers to the research questions has been iterative. The starting point for the research was that there were culture-related problems in design projects. However, the notion of understanding culture covers a wide area, and in the interdisciplinary context in which designers work, discussions about the meaning of terminologies and different perspectives on the same topic pop up easily. First, guidance was needed to be able to study culture in the context of a design project, and for a systematic analysis, a framework that helped to examine culture in the context of a design process was required. For this reason, a design-oriented research approach has been chosen. The cases were necessary in order to determine and enhance a focus, whereas the impetus to study further literature came about through experiential learning (Kolb, 1984), and the application guided the acquisition of knowledge. Now that we have a framework, more systematic research is possible and needed, as will be discussed in Section 6.2.2.

Research Through Design

The simultaneous development of the card set and the theoretical notions behind the set was inspiring, and a great help. The pragmatic goal of supporting designers in examining the culture of their intended users tuned with the researcher's interests and capabilities. The act of designing as part of the research

helped to develop knowledge and kept the research focused. It is therefore appropriate to typify the research with the term Design Inclusive Research, particularised to Research Through Design, as explained in Chapter 1, Section 1.2.3. A drawback was that because of the various roles and activities (teaching, designing, and researching), it was not always easy to take sufficient distance for analysis and reflection.
The published sub-studies in the form of papers in Stage A of the research were useful. Publication appeared to be an effective way to draw intermediate conclusions and to push the research forward, and the involvement of other researchers increased the objectivity. In Stage B (see Figure 3.3), all findings were consolidated, with most of them being analysed anew; the outcomes were applied in the cards.

Educational setting
In addition, this research was undertaken in the context of design education. Though difficult at times, the previously mentioned diverse roles played by the researcher (Section 1.2.4 and Section 3.1.2) led to a comprehensive body of knowledge, and also to a strong commitment on the part of the researcher to carry out the work. Insights from the professional design practice also enriched the results, and contributed to the credibility of the current results. By combining input from teaching with research, new insights were sometimes gained faster than they could be recorded. In addition, the courses had their own planning and learning goals to be taken into account, with the result that the design process involving the cards caused a rapid succession of design iterations. Future researchers need to understand the limitations, and be able to distinguish the possibilities for explorative and generative investigations versus systematic experiments. The first is easier to combine with the learning goals in the courses than is the latter. Above all, the research activities should not have a negative influence on students' learning processes.

Designers and the impact of design
As mentioned earlier, the chosen perspective was centred on the designer, and was based on shared values and practices typical for IDE-Delft and on a design discourse typical for the Western design world. These values and practices were not criticised in this research but were taken as a starting point. The research focused more on these design processes, making designers aware of cultural values and practices in design, rather than giving insights into what designers should do with this cultural awareness, or how to apply the gained insights in the appropriate manner. Especially in BoP projects – where differences between designers and intended users are manifested not only regarding cultural practices but also with respect to economical and political power – many ethical questions arise that were not studied in this research. The BoP projects were selected basically because the large contrast between cultures was helpful in the identification of possible barriers. However, it is important to question the

designer's role and the consequences of his/her interventions: for example, the impact of new products on local cultures, since their environment is an important and even a global concern. In this study, the designer is perceived as an outsider, because he or she is not part of the cultural group – does not live within this group. In the course of this research, I became increasingly aware of the socio-cultural power not only of products but also of language. The term 'outsider' could create an unwanted distance, making designers feel less involved. According to the cultural theorist Peter Sloterdijk, an' outside' does not even exist: *'outside is another inside with another climate control, another thermostat, another air conditioning system'* (in: Latour, 2008, p.7). This is also more or less in line with Gui Bonsiepe's belief that design should be undertaken *in* the periphery and not *for* the periphery[16]. He states, *'I insist and always have insisted on local design practice. Design problems will only be resolved in the local context, and not by outsiders coming in for a stopover visit'* (Fathers, 2003, p.48). Thus, the representation of the designer as an outsider may make him/her feel less responsible and involved.

6.2.2 Further study

Now that there is a framework and a set of cards, the basis for more systematic and hypothetical research has been established (see limitation of the research in Section 6.2.1). Further studies could test hypotheses about, for example, the completeness of the five intentions or to what extent designers in projects address individual, group, and universal aspects of human behaviour.
From Design Inclusive Research, depending on the research question, the research approach could move to both the left (Research in Design Context) and the right (Practice-based Design Research) in Horvath's model (see Figure 1.18). For example, a more experimental approach could be used if designers were asked – and paid – to undertake design projects in a controlled setting.

The broad topic and the research approach in this thesis have led to a number of insights, and helpful guidance has been provided by the set of cards and the framework. These tools are of relevance as well to other experts, such as cultural anthropologists, ethnographic researchers, and professional designers. Further areas of study in which other researchers could become engaged are discussed below.

Three areas

Three areas are distinguished for further research into a culture-conscious approach to design. They are visualised in Figure 6.4.

[16] Gui Bonsiepe adopted the term 'periphery' as a more appropriate way of describing the context of people living in 'developing countries'. He wrote this in 1973 in a paper for the Design for Need conference (Fathers, 2003).

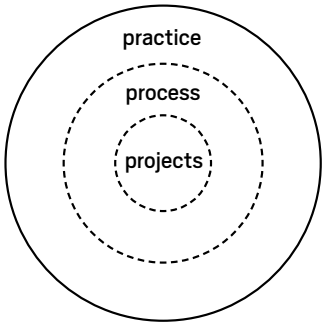


Figure 6.4 Three areas for further study: the professional design practice; the design process; and the projects

The areas include the professional design practice, in which the role of culture-conscious design in the design process and in specific projects can be studied.

1 **The professional design practice**
The framework and card set have been evaluated mainly in the context of design education. However, It would be beneficial to know their value in a professional design practice. The question arises as to how a culture-conscious approach to design as proposed in this thesis fits best within the practice of design. It might then be that the framework and the cards are more suitable in a learning process than in practice. Thus, if we want to teach designers to use the framework and the cards as an approach to practice, the framework and cards must also connect there. This need is in line with the observation of Daalhuizen (2014) that researchers pay little attention to the users of methods. Design practitioners differ from designers in an educational situation for several reasons. For one thing they have much more experience and therefore may encounter other kinds of obstacles. For example, on the basis of their experience they have developed their own design process, so one must ask how the card set could be integrated. Furthermore, an experienced designer may have developed a personal design style that might conflict with the level of acceptance of the intended users; could a designer then design beyond his or her own level of acceptance? In a professional setting, designers might encounter different dilemmas, such as commercial time pressure. Furthermore, the set has been designed from the perspective of a Western designer, and as defined in Chapter 2. It would be interesting to know to what extent the cards are in line with ideas held by product designers such as author designers (BNO, 2005) or non-Western product designers.

2 **The design process**
In this study, the importance of culture has been magnified, whereas it is simply part of a larger scope in the design process. Since an instrument

– comprising the framework and the card set – has been developed, its integration into the design process and existing methods and tools can now be further studied.

Integration – The framework and cards are used, as evaluated and discussed in Chapter 5, mainly in an early stage of the design process. It would be useful to study further how they could be used in relation to other models and approaches, such as those used by the design practitioner, as suggested by the designer in Chapter 5 (Section 5.3.2), where the intended users were first studied from a universal perspective (using motivation theory), followed by a culture-specific approach (using the socio-cultural dimensions).

The five intentions – The aforementioned five intentions in Chapter 5 (affirm, tune, change, bridge, and bypass) resulted from the research, and have not yet been thoroughly studied. They were identified in the variety of design results found in the cases. Each intention could be examined in depth in order to know under what conditions designers might benefit best from it. Researchers interested in 'Design for behaviour change' could further study the intention 'change' and 'bridge'. Moreover, the five intentions could contribute to an increased space for solutions, and consequently contribute to the issues of design fixation (Jansson and Smith, 1991; Perttula and Liikkanen, 2006). The question is how could the card set play a role in this. At least reasoning unconsciously from one's own cultural values could be seen as a form of design fixation that could be avoided with the help of the cards.

Local versus global design – In Section 3.4.3, three options are proposed for approaching the local-global issue. Due to increasing globalisation, the question of how designers deal with different cultural contexts is increasingly relevant. Recent research has responded to this globalisation by introducing the concept of Systemic Context Variation (Kersten et al., 2014). The goal of this design approach is to pursue global innovations by comparing different contexts with each other, and to look for common factors. The framework and the cards could be used here to identify culture-specific differences that require culture-specific solutions. How they might be incorporated into this approach could be the subject of a study.

Culturas – In line with Personas (Cooper, 1999) and Socionas (Postma, 2012), Culturas could be developed. The envisioned Culturas are representations of targeted members of a cultural group, communicating their shared values and how these values are expressed in daily practice. The goal of developing Culturas (visualised to communicate to stakeholders), for which a cultural study is needed, could be an effective motivation for designers to establish an understanding of the culture of intended users. The Culturas could also invite stakeholders involved in design projects to make their preferred values explicit. The Culturas indicate the imagined users, and communicate specific group values – for example, by using quotes from intended users and by showing daily practices – using visuals to demonstrate the material culture. In contrast to a Persona, they illustrate interactions

between people, which – after comparison with other cultures – appear to be typical for the specific situation and group. A study should be undertaken regarding the elements that comprise such a Cultura, and what is needed to make a Cultura useful.

3 **The projects – Culture close to that of the designer**
The cultures studied in the cases differed considerably from those of the designers, and the large contrast helped to distinguish cultural differences. The question arises as to how the framework and card set are applicable in situations where the designer's culture is closer to that of the intended users – for example, when the designer is part of the same culture on a national level – but differs on a professional level. As concluded in Section 3.3, it is important to know on which level culture is being studied.

6.3 A culture-conscious approach in design education

Since this research was conducted in the context of design education, the current section reflects on the meaning of findings for education, when and where.

Culture in a design curriculum
Our design students have difficulties distinguishing between, for example, cultural and utilitarian values. When they observe their intended users, they tend to look at them as individuals and not as members of social groups (van Boeijen, 2014). Maybe because designers – as defined in this research – are taught to integrate, bringing pieces together rather than disassembling them, they easily intertwine utilitarian and cultural insights from user observations. Nevertheless, disassembling is needed to understand the single elements in order to question and discuss them, and to develop a well-supported design direction. Furthermore, as observed in the cases, our design students do not recognise easily that they have already constructed their own norms and values about what comprises a good design; they are simply not aware of them, or at least do not question them.
This research shows that there is sufficient reason to pay attention to culture-conscious design in design education. Design students should be taught how they could do a cultural study in the context of a design project. For design curricula, the following design activities are proposed to teach designers a cultural-conscious approach to design:

1 **Design students should explicitly discuss and determine their intentions in undertaking a cultural study involving a design project**
In their talks on material culture, design historians find if hard to interest students in these lectures (Howell and Christensen, 2014). This is largely because design students do not readily perceive the value of the message and the information being communicated. The students are future and application

driven, are not trained to reflect on a society's development from the past, and do not know how to apply the knowledge in their design projects. Therefore, they need a framework that is focused not only on helping them understand existing cultures but also on how they can implement the information in a generative way. In most of the cases studied, the students can be typified as problem solvers. They study culture to avoid mismatches, and do not easily recognise other possibilities and opportunities to study culture as a means to optimise the design process. For this reason, the Crossing Cultural Chasms Card Set illustrates a wide variety of examples of what cultural understanding could mean for designs. If they make these intentions explicit then it is possible to discuss the possible impact of a chosen intention and its consequences from an ethical perspective.

2 Design students should be taught to examine their own personal and cultural values

Especially in the growing international context in which design students work, it is important for them to understand their own values, and by that to learn to recognise and understand those of others in order to develop a stance and, if needed, to negotiate on conflicting values. Only if they are made explicit is it possible to discuss – within a team, with stakeholders, and with users – personal values, group values, and those based on human nature. It is only then that barriers caused by conflicting values can be recognised more easily, with the result that design students might act upon them or avoid them at an early stage.

Section 3.3 describes how the designer's own values elicit certain personal responses in an international situation, and how these values influence the design process. It would be useful to determine how designers could recognise and acknowledge their own values effectively in advance. Design educators should know how to prepare students by providing them with a lens to help them examine their own culture and that of their intended users, and to support them in reflecting on their experiences.

3 Design students need to experience for themselves the local culture of their intended users

We saw from the cases that designers need to immerse themselves in the culture for which they design. They need to 'get close' to the situation to explore the broader problem situation. In the first place this is needed to gather clues that can lead to the emergence of themes and to develop a frame (Dorst, 2011).

Using sources such as cards, interviewing experts, talking to intended users, and studying the literature is not sufficient to fully understand a culture and to determine a direction for conceptualisation. The hierarchy and importance of values and practices draw from a specific context, and their meaning for product design is difficult to comprehend without the designer being exposed

to this context. Despite the fact that design students, via the Internet, easily have access to other people and to comprehensive information, they need to physically experience differences and similarities. Therefore, it is useful for student designers to have the opportunity to go abroad or to become embedded in a different culture by way of an assignment to map that culture: for example, by building a Cultura (see Section 6.2.2).

6.4 In the end

Finally, we return to the question, discussed in Chapter, 1 of what might have been done better as regards the tricycle. Can in fact a universal hand-operated tricycle exist?
The stakeholders' brief to improve the performance of the current tricycles was important, and our design was driven strongly by utilitarian values (in terms of usability, comfort, and safety). However, expectations regarding adoption of the new design – because of its better performance – by the counterparts were too high. Local cultures could have been studied more intensively by, for example, applying the socio-cultural dimensions to ask culture-relevant questions as to how existing tricycles were valued by their users and by the members of their cultural group. For instance, the extent to which they contributed to the users' identity, and to that of the group to which they belonged, could have been assessed. Possible gender issues could have been discussed explicitly and taken into account. Moreover, the preference booklets (Section 3.5.2) could have been used to expand our understanding of connotations regarding design styles and what was 'most advanced and yet acceptable'. The five intentions might have been helpful to discuss with counterparts explicitly what our intention was with the new design. Based on the findings, it is evident that we should have considered whether the universal design might have been tuned to values held by stakeholders and intended users: for example, by adding specific functions and forms, by designing not only the product but include a whole system, paying attention to other cultural processes such as representation (for example, by including local 'heroes' for the introduction of the new design), and (social) regulation.

In the end, designers will need to acknowledge their own values and the role of cultural values in their design process, not only to establish the desired contact with intended users but also to choose consciously which of those users' social values they intend their design to support. Following from this awareness, the responsibility for the cultural impact that designers' products may have on societies will increase. In turn, design educators must not leave designers to shoulder these responsibilities alone, but provide knowledge and tools to help them implement this awareness.

Summary

Examined from the perspective of diverse disciplines, and for a variety of reasons, the term ‘culture’ is a broad one. The present thesis concerns specifically the discipline of product design, and the main question is how can designers be supported in understanding the culture of the intended users of their products.

The reason for this study arose from the difficulties and uncertainties that designers experienced with regard to the understanding of intended users of their designs by end users living in cultures with which the designers were not familiar. This example applies to European-designed products for use in an Asian context, and which were either not used at all or in an unintended manner. In one instance, a household plastic product was rejected because the material was perceived to be unhygienic; in another, a mobile phone designed for individual use was used collectively. In addition, design methods applied by designers to help them understand end users were not always effective.

Especially now, as increasingly more designers are working on international projects, it is important to know how to deal in a useful way with the concept of culture. With the results of this study, the researcher seeks to offer a framework and tools to help designers cultivate a culture-conscious approach to the design process.

Figure S.1 summarises the major concerns presented in the study.

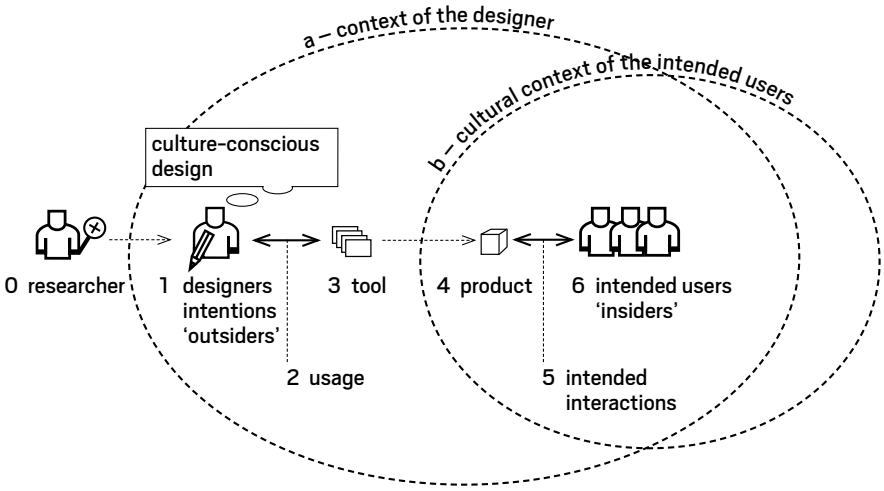


Figure S.1 Summary of the study’s main elements (see Figure 1.12)

Chapter 1 outlines the first possible problems that designers might encounter as a result of not understanding and being unresponsive to the culture of their intended users. Subsequently, the purpose of the study is determined: *To help designers who are engaged in a project in which they are unfamiliar with the culture of their intended users.*

Following from this, research questions are: *What do designers need in a project in which they are unfamiliar with the culture of their intended users? What are cultural barriers they encounter and what opportunities are there to support them?*

To find answers, the Research Through Design approach is chosen (a specification of Inclusive Design Research), in which the development of a tool for designers is key, and knowledge is generated through designing. The designer – as end user – is defined clearly so that it is possible to create an effective tool geared to assist in her or his design process. The main characteristics regarding the context of the designer involve an integral and multidisciplinary approach; being future-oriented and user-centred; and designing in a business context. During the research, the activities fluctuated between theory and empirical reality; see Figure S.2.

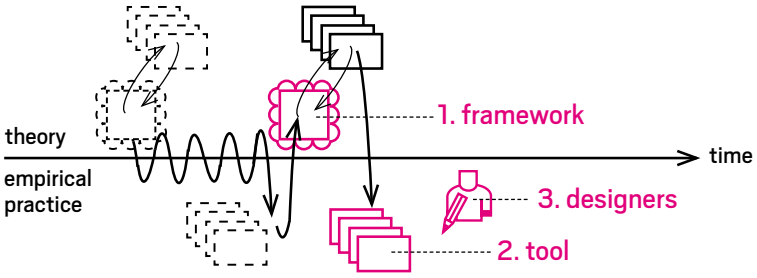


Figure S.2 Repetitive movement from theory to empirical reality, in which a framework and a tool are developed in parallel (see Figure 1.16)

The empirical research took place largely in an educational design context. The researcher – who has a design background – was part of this context, and had the advantage that close observations were possible. This resulted in the findings being abundant, in the sense that the subject could be examined from various angles.

In Chapter 2, the concept of culture is defined further, In particular with a close look at theories from anthropology. Furthermore, attention is paid to how the concept of culture is handled in the discipline of product design, in which culture is approached mainly from the perspective of form, rather than by looking at the

underlying values that represent the material culture. In anthropology, however, values and the associated behaviours are more frequently the starting point. The challenge in the discipline of product design is to link products with those values determined from anthropology as being culture specific. Together, this leads to six elements that comprise a first-stage framework to distinguish cultural values and their practices. The base is composed of Hofstede's onion and cultural dimension models, placed in relation to the Roozenburg Eekels' reasoning model for designers. This framework is both a means to study the empirical reality and the beginning of the development of a lens useful to designers to examine the culture of their intended users.

In Chapter 3, the educative design practice is examined, and includes a study of the obstacles, solutions, and opportunities that designers experience in an unfamiliar context. After all, in order to assist (main question) designers (the intended user of the tool), it is necessary to know how they work, what problems they encounter, and what possibilities contribute to the quality of their design process. The three sub-questions to be answered were: *What are designers' reasons for taking culture into account? How do designers handle the concept of culture? What do designers do to understand the culture of their intended users?* Therefore, the study focused on international projects in which the designer was not familiar with the target culture. The projects were undertaken for professional clients and by design students in the Master Course in Industrial Design Engineering in Delft.

The findings from this section are as follows.
What are designers' reasons for taking culture into account? – It becomes clear that designers' main reason for wanting to understand the culture of end users is to prevent a mismatch between product and user. The designers had their own ideas about how to solve the problems posed, but were not sure whether these solutions were acceptable. How designers dealt with those uncertainties was also interesting. Certainty was sought in the retrospective evaluation of solutions with intended users, and less in using systematic prior questions regarding, for example, shape, properties, functions, needs, and values. Distinguishing utilitarian aspects of cultural values proved to be difficult for designers.

How do designers handle the concept of culture? – The research illustrates that designers found it difficult to distinguish cultural and personal aspects, as well as those that were based on human nature. In this regard, they also had difficulty in delineating the cultural group. Despite these difficulties, however, the findings show that it was useful to make this distinction, as the design students' diverse cultural and personal backgrounds sometimes led to unbalanced representations of target users. Hence, the explicit sharing of other ideas about the values of intended users can uncover potential biases while increasing the design possibilities.

What do designers do to understand the culture of their intended users? – The importance of adjusting research methods to the cultural context is demonstrated. The found obstacles are translated into related guidelines, and are then categorised into the following themes: trust, credibility, language, values, attitude, and education. In addition, it is seen that designers can break through barriers by creating mainly visual research techniques and tools.

The cases studied illustrate the complexity of the concept of culture in a design context. The framework has helped to explain the obstacles resulting from cultural differences. Hofstede's dimensions proved useful for prescribing guidelines regarding participatory research, and many insights from the cases studied have been translated into content for the design tool. Following the three sub-questions in this part of the study, three categories are distinguished: (1) reasons for designers to understand – or not – the culture of intended users (answering the 'why' question); (2) content for the lens that allows designers to distinguish culture in a way that is useful for them (answering the 'what' question), and (3) methods, tools, and tips to assist in an actual study of the intended users' culture (answering the 'how' question).

Chapter 4 elaborates on the elements of the framework. A selection of case studies from Chapter 3 is examined, in which frame elements (dimensions and onion model) are used. In addition, in the context of design education projects, possibilities are explored regarding the use of these models in a generative manner, which means that the culture itself can also provide opportunities. The onion model appears useful at different points in the design process as a tool for both analysis and synthesis. For the application of the dimensions, a number of additional obstacles are identified. These problems give rise to an additional study of the literature, in which cultural dimensions determined by different researchers are analysed and compared. The study leads to a proposal for a unique set of dimensions for designers: namely, the socio-cultural dimensions of hierarchy, identification, time, aim, gender, space, attitude, expression, truth, and 'the ones we do not know'. In addition to the content, the visual representation (form) of the card set is also studied. Insights from Chapters 3 and 4 are then translated into an improved second-stage framework, in which Hofstede's cultural dimensions are replaced by socio-cultural dimensions; the relation of the onion model with these dimensions is visualised; and the relationship with the design discipline is strengthened. The same findings are translated into content for development of the tool.

Chapter 5 describes the tool's development in three steps: Concept 1, Concept 2, and Final Design. It was decided at an early stage to create a set of cards, the main reasons for which involved the set's variable uses; the easy sharing of content (accessibility); the ability to organise and select in order of importance; and the limited space on a card, which forced the researcher to express the message's

essence clearly and succinctly. On the basis of usage evaluations, it is concluded that the cards are useful in helping designers develop a culture-conscious approach to design, especially regarding the preparation of culture-specific research questions and the setting up of a cultural study. In addition, the cards not only help designers become confident that they have not overlooked anything (blind spots), but, as well as their framework function, the cards also serve as a bridge between disciplines (boundary object). It is mainly those designers who are far removed from the culture of the intended user that recognise the usefulness of the cards and the framework, while those who design for intended users in their own country or continent are less apt to recognise the advantage of using the set of cards. Further work, however, is still needed to determine a strategy regarding use of the cards that fits in with a procedure in which universal values or motivations are also included. A large number of examples are required. Limitations are discussed in Chapter 6.

During the course of this study, five intentions emerged as to why designers choose to take the culture of target users into account in the design process: these are (1) to affirm a culture; (2) to tune to a culture to prevent a mismatch between product and user; (3) to change a culture; (4) to bridge two or more cultures; and (5) to bypass culture for the sake of a different focus. These intentions can be used to develop a design direction, and to determine the objective or objectives for cultural research within a design project.

In Chapter 6, the theory, the research approach, future research, design education, and design practice are examined. The study's main findings are summarised in the framework and in the set of cards, and they provide a satisfactory answer to the question as to how designers can be supported in developing a culture-conscious approach to design. The framework is both abstract (essence) and concrete (an imaginable form) enough to use in examining the cultural values of intended users.

However, the framework also has a limitation. A weakness of the framework is that it involves only the shared values of groups regarding their ways of interacting with each other, and excludes contextual factors that might influence these values, such as economy, technology, and politics. Another limitation of the framework is that it does not help in terms of the dynamics of cultural processes, such as representation, regulation, and identity, as described by the Circuit of Culture (du Gay et al., 2004). A more complete model for designers could be one that comprises the framework together with the processes.

A limitation of the cards is that they do not explicitly involve the designer's own cultural and personal values. The cards read as a one-way direction to support designers with their international work. The designers and their work are given as a starting point without questioning it in ethical terms. The primary aim

of the cards is to help these designers to become *aware* of culture in a design project rather than to give them an answer on what they should do or not with this awareness. In that respect the aim is more process oriented than content. The content does not give designers a helping hand if they are confronted with conflicting values.

The Research Through Design approach, where theory and cards were developed simultaneously, proved to be inspiring and useful, as the clear and pragmatic goal kept the research focused and applicable for designers. An understanding of culture in the context of the design discipline has now been built, and in future studies a more systematic approach can be chosen.

Three focal areas for future research are proposed. The first comprises the whole, and focuses on how the framework and the cards can be applied to cultures, and examines culture-conscious design in the domain of the *professional design practice*. The second focus is on further research within the professional design practice, and on the integration of the framework and use of the card set in the *design process*. In addition, further research is proposed regarding the five intentions described in Chapter 5: namely, an approach for dealing with designs for different cultural contexts (global design), and – in imitation of Personas and Socionas – the development of Culturas. The third focus is on the nature of the *design projects*, with a close look at cultures that are close to that of the designer.

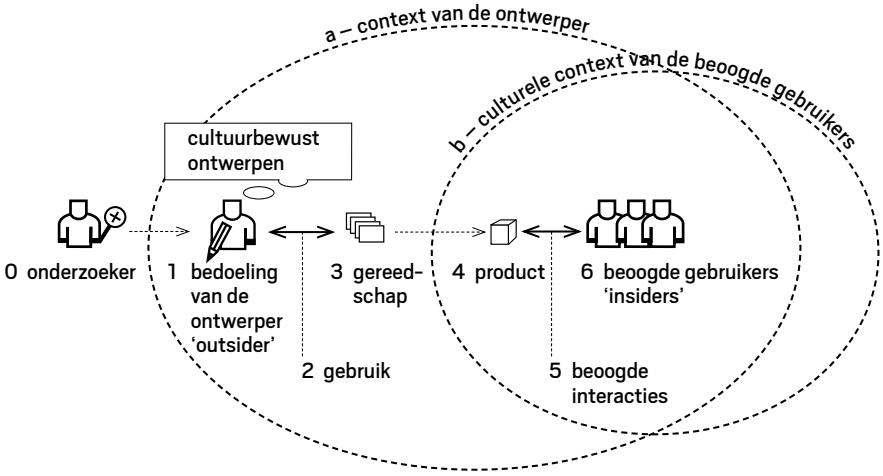
Finally, design education is examined. For the benefit of students keen to develop a culture-conscious approach to design, the following points are proposed: (1) design students should determine their reasons for undertaking a cultural study involving a design project; (2) they should be taught to examine their own personal and cultural values; and (3) they need to experience first-hand the local culture of their intended users.

Samenvatting

Cultuur is een veelomvattend begrip dat vanuit verschillende disciplines en met uiteenlopende perspectieven wordt bestudeerd. Dit proefschrift gaat over de discipline productontwerpen, waarin de vraag wordt gesteld hoe productontwerpers kunnen worden ondersteund bij het begrijpen van de cultuur van de gebruikers van hun producten.

De reden voor deze studie is voortgekomen uit de barrières en onzekerheden die ontwerpers hebben ervaren ten aanzien van het begrijpen van beoogde gebruikers die leven in een cultuur waar de ontwerper niet vertrouwd mee is. Dit is bijvoorbeeld van toepassing op Europees ontworpen producten voor het gebruik in een Aziatische context, die niet of anders gebruikt werden dan beoogd. Zo werd bijvoorbeeld een kunststof huishoudelijk product niet geaccepteerd, omdat het materiaal als onhygiënisch werd ervaren, en een mobiele telefoon die ontworpen is voor individueel gebruik, werd collectief gebruikt. Ook ontwerpmethoden die werden ingezet door ontwerpers om eindgebruikers te begrijpen waren niet altijd effectief.

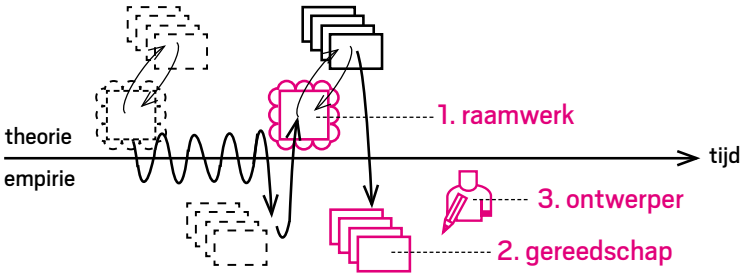
Omdat steeds meer productontwerpers internationaal werken is het belangrijk om te weten hoe met het begrip cultuur kan worden omgegaan op een voor hen bruikbare manier. Met de resultaten van dit onderzoek beoogt de onderzoeker ontwerpers een raamwerk en een gereedschap te bieden die helpen bij een cultuurbewuste benadering van het ontwerpproces. Figuur S.1 geeft een overzicht van de belangrijkste elementen in het onderzoek.



Figuur S.1 Overzicht van de hoofdelementen van het onderzoek (zie ook Figuur 1.12)

Hoofdstuk 1 schetst eerst mogelijke problemen die ontwerpers kunnen tegenkomen als gevolg van het niet begrijpen en niet inspelen op de cultuur van hun beoogde gebruikers (aanleiding voor het onderzoek). Vervolgens is het doel van het onderzoek vastgesteld: *Het helpen van ontwerpers die betrokken zijn bij een project waarin zij niet bekend zijn met de cultuur van hun beoogde gebruikers.* De daaruit volgende onderzoeksvragen zijn: *Wat hebben ontwerpers nodig in een project waarin zij niet bekend zijn met de cultuur van hun beoogde gebruikers? Wat zijn culturele barrières die ze tegenkomen en welke mogelijkheden zijn er om hen te ondersteunen?*

Voor het vinden van antwoorden is de Research Through Design aanpak gekozen (een verbijzondering van Inclusive Design Research), waarin de ontwikkeling van een gereedschap (tool) voor ontwerpers centraal staat en al ontwerpend kennis wordt gegenereerd. De ontwerper – als gebruiker – is gedefinieerd zo dat een effectief gereedschap kan worden ontworpen dat is afgestemd op zijn of haar ontwerpproces. De uitgangspunten voor de context van de ontwerper bestaan hoofdzakelijk uit: een integrerende en multidisciplinaire aanpak; toekomstgericht denkend; de gebruiker centraal stellend, en ontwerpend in een bedrijfscontext. Gedurende het onderzoek meanderen de activiteiten tussen theorie en de empirie, zie Figuur S.2.



Figuur S.2 Repeterende beweging van theorie naar empirie, waarin parallel aan elkaar een raamwerk en een gereedschap zijn ontwikkeld (zie ook Figuur 1.16)

Het empirisch onderzoek vond voor een groot deel plaats in een educatieve ontwerpcontext. De onderzoeker – met een ontwerpachtergrond – was onderdeel van deze context en heeft een ontwerpachtergrond met als voordeel dat het waarnemen van dichtbij mogelijk was. Dit resulteerde in rijke bevindingen rijk, in die zin dat het onderwerp van veel kanten kon worden bestudeerd.

In hoofdstuk 2 is het begrip cultuur nader gedefinieerd, gebruikmakend van met name antropologische theorieën. Daarnaast is onderzocht hoe in de discipline van het productontwerpen met het begrip cultuur wordt omgegaan. Cultuur wordt daarin vooral benaderd vanuit de vormwereld. Minder aandacht gaat uit

naar de onderliggende waarden die de materiële cultuur vertegenwoordigen. De antropologie gaat daarentegen veel vaker uit van waarden en de daarmee verbonden gedragingen. De uitdaging lag erin om die waarden die vanuit de antropologie bepaald zijn als cultuur specifiek, in verbinding te brengen met producten. Gezamenlijk leidde dit tot zes elementen die samen een raamwerk (first-stage framework) vormen om culturele waarden en praktijken te onderscheiden. De basis is het model van Hofstede (het ui model en de culturele dimensies) dat in verband is gebracht met het redeneermodel voor ontwerpers van Roozenburg en Eekels. Dit raamwerk is zowel een middel om de empirie te onderzoeken als een begin van de ontwikkeling van een lens voor ontwerpers om de cultuur van hun beoogde gebruikers te bestuderen.

In hoofdstuk 3 is de (educatieve) ontwerppraktijk onderzocht. Er is gekeken naar de barrières, oplossingen en kansen die ontwerpers ervaren in een context waarin zij niet vertrouwd zijn met de cultuur van hun eindgebruikers. Immers, om ontwerpers (de beoogde gebruiker van het gereedschap) te kunnen helpen (hoofdvraag) moet bekend zijn hoe zij werken, waarmee zij problemen hebben, en welke mogelijkheden er zijn om aan de kwaliteit van hun ontwerpproces bij te kunnen dragen. De drie subvragen die worden beantwoord zijn: *Wat zijn de redenen van ontwerpers als het gaat om het rekening houden met cultuur?; Hoe gaan ontwerpers om met het concept cultuur?; Wat doen ontwerpers om de cultuur van hun beoogde gebruikers te begrijpen?* Hiertoe zijn internationale ontwerpprojecten bestudeerd, waarin de ontwerper zelf ver afstaat van de doelcultuur. De projecten zijn uitgevoerd voor professionele opdrachtgevers en door ontwerpstudenten van de masteropleidingen Industrial Design Engineering in Delft.

De bevindingen uit dit deel zijn als volgt.
Wat zijn de redenen van ontwerpers als het gaat om het rekening houden met cultuur? – De belangrijkste reden van de ontwerpers om de cultuur van eindgebruikers te begrijpen is het voorkomen van een verkeerde combinatie (mismatch) tussen product en gebruiker. De ontwerpers hadden hun eigen manier om problemen op te lossen, maar ze waren niet zeker of de oplossingen ook acceptabel zouden zijn voor de beoogde gebruiker. Hoe ze omgingen met die onzekerheden was ook interessant. Zekerheden werd gezocht in het achteraf evalueren van oplossingen met beoogde gebruikers en minder met behulp van systematisch vooraf gestelde vragen ten aanzien van bijvoorbeeld vorm, eigenschappen, functies, behoeften en waarden. Het onderscheiden van utiliteitswaarden en culturele waarden bleken de ontwerpers lastig te vinden.

Hoe gaan ontwerpers om met het concept cultuur? – Uit het onderzoek komt naar voren dat ontwerpers het moeilijk vinden om culturele aspecten, persoonlijke aspecten en aspecten die gebaseerd zijn op de menselijke natuur te onderscheiden. En daarbij ondervinden zij ook moeilijkheden

bij het afbakenen van de culturele groep. Het blijkt dat ondanks deze moeilijkheden het nuttig is om dit onderscheid te maken; de verschillende culturele en persoonlijke achtergronden van ontwerpstudenten leidden namelijk tot ongelijke voorstellingen van beoogde gebruikers. Het expliciet delen van andere denkbeelden over de waarden van beoogde gebruikers kan mogelijke vooroordelen blootleggen en tegelijkertijd de ontwerpruimte vergroten.

Wat doen ontwerpers om de cultuur van hun beoogde gebruikers te begrijpen? – Tenslotte is het belang aangetoond van het aanpassen van onderzoeksmethoden aan de culturele context. De gevonden barrières zijn vertaald naar gerelateerde richtlijnen, en ze zijn daarna gecategoriseerd in de thema's: vertrouwen, geloofwaardigheid, taal, waarden, houding en educatie. Daarnaast is gevonden dat barrières door ontwerpers worden overwonnen door het zelf ontwerpen van, vooral visuele, onderzoekstechnieken en gereedschappen.

De bestudeerde casussen illustreren de complexiteit van het concept cultuur in een design context. Het raamwerk heeft geholpen om de gevonden barrières als gevolg van cultuurverschillen te kunnen verklaren. De dimensies van Hofstede blijken bruikbaar voor het voorschrijven (richtlijnen) van participatief onderzoek. Veel inzichten uit de bestudeerde casussen zijn vertaald naar inhoud voor het ontwerpgereedschap (tool). In navolging van de drie subvragen in dit deel van het onderzoek worden drie categorieën onderscheiden: 1 – redenen voor ontwerpers om de cultuur van beoogde gebruikers wel of niet te willen begrijpen (beantwoorden van de waaromvraag); 2 – inhoud voor de lens waarmee ontwerpers op een voor hen bruikbare manier cultuur kunnen onderscheiden (beantwoorden van de wat-vraag), en 3 – Methoden, gereedschappen en tips om daadwerkelijk de cultuur van beoogde gebruikers te bestuderen (beantwoorden van de hoe-vraag).

In hoofdstuk 4 is dieper ingegaan op de elementen van het raamwerk. Een selectie van casussen uit hoofdstuk 3, waarin raamwerkelementen zijn gebruikt (dimensies en ui model), zijn nader bestudeerd. Daarnaast zijn, in de context van educatieve ontwerpprojecten, mogelijkheden verkend voor het op een generatieve manier toepassen van deze modellen, waarmee bedoeld wordt dat cultuur ook kansen met zich mee kan brengen. Het ui model blijkt als ontwerpgereedschap voor zowel analyse als synthese op verschillende momenten in het ontwerpproces bruikbaar. Voor het toepassen van de dimensies door ontwerpers worden een aantal additionele barrières geconstateerd. Deze barrières zijn aanleiding voor een extra literatuurstudie waarin culturele dimensies van verschillende onderzoekers worden geanalyseerd en met elkaar worden vergeleken. De studie leidt tot een voorstel voor een eigen set van dimensies voor ontwerpers, de socio-cultural dimensions: hierarchy, identification, time, aim, gender, space, attitude, expression, truth en 'the ones we do not know yet'. Naast de inhoud is ook de visuele representatie (vorm) van de set onderzocht. Inzichten uit hoofdstuk 3 en 4

zijn vervolgens vertaald in een verbeterd raamwerk (second-stage framework), waarin de culturele dimensies van Hofstede zijn vervangen door de socio-cultural dimensions, de relatie van het uimodel met deze dimensies is gevisualiseerd, en de relatie met de design discipline is versterkt. Diezelfde inzichten zijn vertaald naar inhoud voor de ontwikkeling van het gereedschap (tool).

Hoofdstuk 5 beschrijft de ontwikkeling van het gereedschap in drie stappen; Concept 1, Concept 2 en Final Design. In een vroeg stadium is besloten voor een kaarten set. Belangrijkste redenen hiervoor zijn de variabele gebruiksmogelijkheden, het gemakkelijk delen van de inhoud (toegankelijkheid) en het in volgorde van belangrijkheid kunnen selecteren en ordenen. Ook dwingt de beperkte ruimte die een kaart biedt de onderzoeker tot het communiceren van de essentie. Uit gebruiksevaluaties is geconcludeerd dat de kaarten helpen bij het cultuurbewust benaderen van het ontwerpen, met name voor het opstellen van cultuurspecifieke onderzoeksvragen en het opzetten van een culturele studie. Daarnaast geven de kaarten een gevoel van compleetheid en daarmee het vertrouwen dat niets over het hoofd is gezien (blinde vlekken), en werken zowel de kaarten als het raamwerk als een brug tussen disciplines (boundary object). Het nut van de kaarten en het raamwerk worden vooral herkend door ontwerpers die ver afstaan van de cultuur van de beoogde gebruiker en minder door ontwerpers die ontwerpen voor beoogde gebruikers in bijvoorbeeld eigen land of continent. Een procedure voor het gebruik van de kaarten dat past binnen een procedure waarin ook universele waarden of motivaties worden meegenomen zal nog verder uitgewerkt moeten worden. Er is behoefte aan veel voorbeelden. In hoofdstuk 6 worden beperkingen genoemd.

Tijdens het verloop van dit onderzoek zijn er vijf intenties voor de ontwerper naar voren gekomen om de cultuur van de beoogde te gebruikers mee te nemen in het ontwerpproces; 1 – het versterken van een cultuur (affirm); 2 – het afstemmen op de cultuur om een verkeerde combinatie tussen product en gebruiker (mismatch) te voorkomen (tune); 3 – het veranderen van de cultuur (change); 4 – het verbinden van culturen (bridge), en 5 – het voorbij gaan aan cultuur omwille van een andere focus (bypass). Deze intenties kunnen in het ontwerpproces expliciet worden gebruikt bij het ontwikkelen van een ontwerprichting en om te bepalen welk doel of welke doelen het culturele onderzoek in een ontwerpproject dient.

In hoofdstuk 6 is gereflecteerd op het raamwerk en de kaartenset, de onderzoeksaanpak, toekomstig onderzoek, het ontwerponderwijs en de ontwerppraktijk. De belangrijkste uitkomsten van het onderzoek zijn samengevat in het raamwerk en de kaartenset. Zij vormen een toereikend antwoord op de vraag hoe ontwerpers kunnen worden geholpen bij een cultuurbewuste ontwerpaanpak. Het raamwerk is zowel abstract (essentie) als concreet (als vorm voorstelbaar) genoeg om als een lens te gebruiken bij het onderzoeken van culturele waarden van beoogde gebruikers.

Echter, het raamwerk heeft ook een beperking. Het omvat alleen de gedeelde waarden van een groep ten aanzien van de manier waarop ze met elkaar interacteren. Het betrekt daarbij geen contextuele factoren – zoals economie, technologie en politiek – die deze waarde kunnen beïnvloeden. Daarnaast laat het niet de dynamiek van culturele processen zien, zoals die van representatie, regulatie, en identiteit, beschreven in de Circuit of Culture (du Gay, et al., 2004). In een completer model zou het raamwerk samen kunnen worden genomen met deze processen.

Een beperking van de kaarten is dat ze niet expliciet de waarden van de ontwerper erbij betrekken. Het primaire doel van de kaarten is om deze ontwerpers te helpen bij het bewust worden van cultuur in een ontwerpproject, meer dan het geven van antwoorden op de vraag wat ze ermee zouden moeten doen. Het doel is wat dat betreft meer gericht op het proces dan op de inhoud. De inhoud geeft de ontwerpers ook geen hulp bij het omgaan met conflicterende waarden.

De Research Through Design aanpak, waarin gelijktijdig theorie en de kaartenset worden ontwikkeld, is inspirerend en bruikbaar gebleken. Het duidelijke en pragmatische doel hielden het onderzoek gericht en de uitkomsten toepasbaar voor ontwerpers. Nu er een begrip van cultuur in de context van de ontwerpdiscipline is opgebouwd kan in toekomstig onderzoek voor een meer systematische aanpak worden gekozen.

Voor toekomstig onderzoek worden drie gebieden voorgesteld. De eerste omvat het geheel en richt zich op het toepassen van het raamwerk en de kaarten op cultuurbewust ontwerpen in het domein van de *professionele ontwerppraktijk*. Het tweede gebied richt zich op onderzoek daarbinnen naar het integreren van het raamwerk en gebruik van de kaartenset in *het ontwerpproces*. Ook is nader onderzoek voorgesteld ten aanzien van de in hoofdstuk 5 genoemde vijf intenties, een aanpak voor het omgaan met ontwerpen voor verschillende (culturele) contexten (global design), en het – in navolging van Personas en Socionas – ontwikkelen van Culturas. Het derde gebied richt zich op de aard van de *ontwerpprojecten*, waarbij aandacht voor culturen die dichtbij de cultuur van de ontwerper staan.

Tenslotte is gereflecteerd op het ontwerponderwijs. Ten behoeve van een cultuurbewuste aanpak in het ontwerpen zijn de volgende leerpunten voorgesteld. (1) Ontwerpstudenten zouden hun intenties moeten bepalen waarvoor zij een culturele studie in een ontwerpproject doen. (2) Ontwerpstudenten zouden geleerd moeten worden eigen persoonlijke en culturele waarden te bestuderen. (3) Ontwerpstudenten moeten zelf de cultuur van hun beoogde eindgebruiker kunnen ervaren.

References

Archer, B. (1995), The nature of research, *Co-Design: International Journal of CoCreation in Design and Arts*, 2, 6-13.

Arik, D., van Boeijen, A.G.C., Kandachar, P.V. (2009). Persuasion for a Healthier Life: Persuasive Technology Design Guidelines from the Precious Project for Indian Diabetics. *Proceedings of the International Association of Societies of Design Research Conference*, Seoul, South Korea.

Attfield, J. (2000). *Wild things*. Oxford: Berg.

Bates, D.G., Plog, F. (1976). *Cultural Anthropology* (3rd ed.). New York: McGraw-Hill.

Bijker, W.E. (1995). *Of Bicycles, Bakelites and Bulbs: towards a theory of socio-technical change, inside technology*. Cambridge, MA: MIT Press.

Bracht, P., Visser, A.A., Ball, R. (2008). I do: A pressure cooker model for the experience of cultures and design. *Proceedings of DesignEd Asia Conference 2008: Culture as Inspiration*. Hong Kong.

Brown, D.E. (1991). *Human Universals*. New York: McGraw-Hill, Inc.

Barber, W., Badre, A. (1998). *Culturability: the merging of culture and usability.* In proceedings of the 4th Conference on Human Factors and the Web, Basking Ridge, New Jersey, USA.

BNO (2005). *Innovation and Design: beschouwingen en aanbevelingen ten aanzien van de rol van design in innovatietrajecten* (in response to Ons Creatief Vermogen, EZ publication). Amsterdam: Bond Nederlandse Ontwerpers.

Boradkar, P. (2010). *Designing things: A critical introduction to the culture of objects*. Oxford: Berg.

Boom, S., Diehl, J.C., Silvester, S. (2008). Lighting for rural Cambodia: an example of social responsible design. *Proceedings of the Tools and Methods of Competitive Engineering Conference*, Izmir, Turkey.

Bos, E.D., Jacobs, J.J. (Ed.). (2006). *Self Evaluation part 2*. Delft: Faculty of Industrial Design Engineering.

Boztepe, S. (2007a). User Value: Competing Theories and Models. *International Journal of Design*, 1(2), 55-63.

Botzepe, S. (2007b). Toward a framework of product development for global markets: A user-value-based approach. *Design Studies*, 28(5), 513-533.

Botzepe, S. (2008). Competing with global players. *Proceedings of the International DMI Education Conference*, 14-14 April 2008, Cergy-Pointoise, France.

Carlile, P.R. (2002). A pragmatic view of knowledge and boundaries: Boundary objects in new product development. *Organization Science,* 13(4), 442-455.

Chambers, R. (1994). The origins and practice of participatory rural appraisal. *World Development*, 22(7), 953-969. doi: 10.1016/0305-750X(94)90141-4

Chambers, R. (1997). *Whose Reality Counts?: Putting the First Last*. London: Intermediate Technology Publications.

Chambers, R. (2007). *From PRA to PLA to Pluralism: Practice and Theory*. IDS Working Paper 286, Brighton: IDS.

Chavan, A.L., Gorney, D., Prabhu, B., Arora, S. (2009). The Washing Machine that Ate My Sari – Mistakes in Cross-Culture Design. *Interactions* 16(1), 26-31.

Cooper, A. (1999). *The Inmates are Running the Asylum: Why high tech products drive us crazy and how to restore the sanity*. Indianapolis: Sams Publishing.

Cottle, T. (1967). The Circle Test; an investigation of perception of temporal relatedness and dominance. *Journal of Projective Technique and Personality Assessments, 31*, 58-71.

Courage, C. Baxter, K. (2005). *Understanding your users: A practical guide to user requirements, methods, tools and techniques*. Amsterdam: Elsevier-Morgan Kaufmann Publishers.

Daalhuizen, J.J. (2014). *Method usage in design: How methods function as mental tools for designers.* Doctoral thesis, Delft University of Technology, Delft.

de Mooij, M.K. (2004). *Consumer behaviour and culture: Consequences for global marketing and advertising*. London: Sage Publications.

de Rijk, T.R.A. (2014). *On Design, Culture and the Future*. Inaugural lecture for Delft University of Technology and Leiden University, p.11. Retrieved December 2014, from http://issuu.com/whatdesigncando/docs/wdcd_2014_book_timo.

Douma, A.C. (2014). *A market entry strategy for HyperWash's hand-powered washing machine targeting low-income households in Gujarat*. Master thesis, Delft University of Technology, Delft.

Dorst, K. (2011). The core of 'design thinking' and its application. *Design Studies*, 32, 521-532. doi: 10.1016/j.destud.2011.07.006

Eco, U. (2002, original publication 1972). *Einfuhrung in die Semiotik*: UTB Germany.

du Gay, P., Hall, S., Janes, L., Mackey, H., Negus, K. (1997). *Doing Cultural studies: The Story of the Sony Walkman*. London: Sage Publications (in association with the Open University).

Egbert, S. (1998). Book review: Tricycle Production Manual. *Appropriate Technology,* 25(1).

Fallan, K. (2010). *Design history: understanding theory and method*. London, New York: Bloomsburry Academic.

Fathers, J. (2003). An interview with Gui Bonsiepe charting a lifetime of commitment to design empowerment. *Design Issues*, 19(4), 44-56.

Ford, M.E., Nichols, C.W. (1987). A taxonomy of human goals and some possible applications. In M.E. Ford, D.H. Ford (Eds.), *Humans as self-constructing living systems: putting the framework to work* pp. 289-311. Hillsdale, New Jersey: Erlbaum.

Ford, M.E. (1992). *Motivating humans: Goals, emotions, and personal agency beliefs*. Newbury Park: Sage Publications.

Gall, C., Arantes, B., Barros, I., Garskamp, A., Redman, M., Lahade, S., Maier, I. (2012). *Culture, workplace and design: The office code unveiled*. In the Design Research Society Conference, 1-7 July 2012, Bangkok.

Gaver, B., Dunne, T., Pacenti, E. (1999). Design: Cultural probes. *Interactions, 6*(1), 21-29.

Geertz, C. (1973). *The interpretation of cultures*: Harper Torchbooks (5043).

Gunn, W., Otto, T., Smith, R.C. (2013) (Eds.). *Design anthropology: Theory and practice*. London: Bloomsbury.

Gupta, A.K. (2010). Grassroots Green Innovations for Inclusive, Sustainable Development. In A. Lopez-Claros (Ed.), *The Innovation for Development Report 2009-2010, Strengthening Innovation for the Prosperity of the Nations* (pp. 137-146). New York: Palgrave Macmillan.

Hall, E.T. (1966). *The Hidden Dimension*. New York: Anchor Books.

Hall, E.T. (1973). *The silent language*. New York: Anchor books.

Hall, E.T. (1976). *Beyond Culture.* New York: Anchor Books.

Harding, S.F. (1984). *Remaking Ibieca: Rural Life in Aragon under Franco*. Chapel Hill, USA: University of North Carolina Press.

Hekkert, P.P.M. (2009). Something that is not Moving is Hard to Perceive; On the primacy of universal human principles in design. *Proceedings of International Association of Societies of Design Research Conference*, Seoul, South Korea.

Hekkert, P.P.M., van Dijk, M. (2011). *Vision in Design: A Guidebook for Innovators*. Amsterdam: BIS.

Hellemans, B.S. (2014). *Cultuur (from the series 'Elementaire deeltjes')*. Amsterdam: AUP.

Hofstede, G.H. (1997). *Cultures and Organizations: Software of the Mind* (1st ed.). New York: McGraw-Hill, USA.

Hofstede, G.H., Hofstede, G.J. (2005). *Cultures and organizations, software of the mind* (2nd ed.). New York: McGraw-Hill.

Hofstede, G.H. (2006). What did GLOBE really measure? Researchers' minds versus respondents' minds. *Journal of International Business Studies*, 37, 884.

Hofstede, G.H., Hofstede, G.J., Minkov, M. (2010). *Cultures and organizations, software of the mind* (3rd ed.). New York: McGraw-Hill USA.

Honold, P. (2000). Culture and context: An empirical study for the development of a framework for the elicitation of cultural influence in product use. *International Journal of Human-Computer Interaction, 12*(4), 327-345.

Horváth, I. (2007). Comparison of three methodological Approaches of design research. *Proceedings of International Conference on Engineering Design*, 28-31 August 2007, Cité des sciences et de l'industrie, Paris, France.

House, R.J., Hanges, P.J., Javidan, M., Dorfman, P.W., Gupta, V. (2004). *Culture, leadership and organizations: The GLOBE study of 62 Societies*. London: Sage Publications Inc.

Howell, B., Christensen, K. (2013). Out of the lecture and into the studio: A new take on teaching design history. *Proceedings of the Engineering and Product Design Education Conference*, 5-6 September 2013, Dublin, Ireland.

I do 2005 (2005). *I.do: The international Design workshop 2005*. Hong Kong: SD Press.

I do 2008 (2008). *I.do: The international Design workshop* 2008. Hong Kong: SD Press.

I do 2009 (2009). *I.do: The international Design workshop* 2009. Hong Kong: SD Press.

Inglehart, R.B.M., Moreno, A. (1998). *Human values and beliefs*. Ann Arbor: The University of Michigan Press.

Inglehart, R.B.M., Baker, W.E. (2000). Modernization, cultural change, and the persistence of traditional values. *American Social Review*, 65(1), 19-51.

Inkeles, A., Levinson, D.J. (1969 (original publication in 1954)). National character: the study of modal personality and sociocultural systems. In G. Lindsey, E. Aronson (Eds.), *The Handbook of Social Psychology* (2 ed., Vol. 4). Reading: Addison-Wesley.

Joy, S., Kolb, D.A. (2009). Are there cultural differences in learning style? *International Journal of Intercultural Relations, 33*(1), 69-85.

Kamp, I. (2012). *Comfortable car interiors – Experiments as a basis for car interior design contributing to the pleasure of the driver and passengers.* Doctoral thesis, Delft University of Technology, Delft.

Kandachar, P.V., Halme, M. (2008, Eds.). *Sustainability Challenges and Solutions at the Base of the Pyramid: Business, Technology and the Poor*. Sheffield: Greenleaf Publishing.

Kandachar, P.H., de Jongh, I., Diehl, J.C. (2009). *Designing for Emerging Markets-Design of Products and Services*. Delft: Delft University of Technology.

Karnani, A. (2007). Fortune at the Bottom of the Pyramid: A Mirage How the private sector can help alleviate poverty. *California Management Review, 49*(4), 90-111.

Kelley, T., Littman, J. (2001). *The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm*. New York: Doubleday-Random House.

Kersten, W.C., Crul, M.R.M., Diehl, J.C., van Engelen, J.M.L. (2014). *Da Vinci 3.0: Systemic Context Variation*. Working Paper, version 2.0. Delft University of Technology- Industrial Design Engineering. Retrieved October 2014, from http://www.io.tudelft.nl/onderzoek/onderzoeksprogrammas/technology-transformation/design-for-sustainability-emerging-markets/sub-theme-5-systemic-context-variation/

Kirkman, B.L., Shapiro, D.L. (2005). The impact of Cultural Diversity on Global Perspectives. *Elsevier Ltd, 18*, 33-67.

Kluckhohn, F., Strodtbeck, F.L. (1961). *Variations in Value Orientations*. Westport, Connecticut: Greenwood Press.

Kluckhohn, C. (1962). *Culture and behavior*. New York: The Free Press.

Kolb, D.A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Upper Saddle River, New Jersey: Prentice Hall.

Kress, T.M. (2011). Critical Praxis Research: *Breathing New Life into Research Methods for Teachers.* Springer Netherlands.

Kreuter, M.W., Haughton, L.T., 2006, Integrating Culture Into Health Information for African American Women. *American Behavioral Scientist*, Vol. 49, No. 6, 794-811.

Kroeber, A.L., Kluckhohn, C. (1952). *Culture: A Critical Review of Concepts and Definitions*, (Vol. 47). Cambridge, USA: Peabody Museum of American Archaeology and Ethnology Papers.

Lee, K. (1999). A Study on the Cultural Effects on User-Interface Design With the Emphasis on the Cross-Cultural Usability Testing through World Wide Web. *Proceedings of the Asian Design Conference*, Nagaoka, Japan.

Levin, J.R., Anglin, G.J., Carney, R.N. (1987). *On Empirically validating functions of pictures in prose.* In D.M. Willows and H.A. Houghton (Eds), The Psychology of Illustration, Basic Research, 2 (pp. 51-85). New York: Springer.

Levine, R. (2006). *A geography of time; the temporal misadventures of a social psychologist*. Oxford: Oneworld Publications.

Lewin, K. (1936). Some Social-Psychological Differences between the US and Germany. In K. Lewin (Ed.), *Principles of Topological Psychology*. Transl. Fritz Heider & Grace M. Heider. New York: McGraw-Hill.

Lewis, R.D. (1999). *When cultures collide: Managing successfully across cultures*: Nicholas Brealey Publishing.

Lindholm, C., Keinonen, T., Kiljander, H. (2003). *Mobile Usability: How Nokia Changed the Face of the Mobile Phone*. New York: McGraw-Hill Professional.

Loewy, R. (1951). *Never Leave Well Enough Alone*. New York: Simon and Schuster.

McGarty, C., Yzerbyt, V.Y., Spears, R. (2002). *Social, cultural and cognitive factors in stereotype formation*. In Stereotypes as explanations: The formation of meaningful beliefs about social groups. Cambridge: Cambridge University Press.

Margolin, V. (2007). Design, the future and the human spirit. *Design Issues*, 23(3).

Martin, B., Hanington, B. (2012). *Universal Methods of Design*. Beverly: Rockport Publishers.

Miller, D. (Ed.) (1998*). Material cultures: Why some things matter*. London: The University of Chicago Press.

Minkov, M. (2007). *What Makes Us Different and Similar: A New Interpretation of the World Values Survey and Other Cross-Cultural Data*. Sofia: Klasika I Stil.

Minkov, M., Hofstede, G.H. (2011). The evolution of Hofstede's doctrine. *Cross Cultural Management: An international journal*, 18(1), 10-20.

Muller, W. (2001). *Order and meaning in design*. Utrecht: Lemma.

Nisbett, R.E. (2003). *The geography of thought. How Asians and Westerners think differently and Why*. New York: The Free Press.

Oosterlaken, I. (2009). Design for development: a capability approach. *Design Issues, 25*(4), 91-102.

Otto, T., Smith, R.C. (2013). Design Anthropology: A distinct style of knowing. In W. Gunn, T. Otto, R.C. Smith (Eds.), *Design anthropology: Theory and practice* (pp. 1-29). London: Bloomsbury.

Peterson, B. (2004). *Cultural Intelligence.* London: Intercultural Press.

Pinker, S. (2002). *The blank slate: the modern denial of human nature.* London: The Penguin Press.

Pleij, H. (2010). *Cultuurgeschiedenis van Nederland: Hoorcollege over de historische ontwikkeling van de Nederlandse identiteiten.* Gouderak: Home Academy Publishers.

Postma, C.E., Stappers, P.J. (2006). A Vision on Social Interactions as the Basis for Design. *CoDesign*, 2(3), 139-155.

Postma, C.E. (2012). *Creating Socionas: Building creative understanding of people's experiences in the early stages of new product development*. Doctoral thesis, Delft University of Technology, Delft.

Prahalad, C.K. (2005). *The Fortune at the Bottom of the Pyramid; eradicating poverty through profits*. Pennsylvania: Wharton School Publishing.

Pries, J.F.F., van Boeijen A.G.C., van der Lugt, R. (2012). Deep inside friendly territory: Involving remote co-researchers to understand global users. *Proceedings of the ServDes 2012 Conference*, 8-10 February 2012, Helsinki, Finland.

Razzaghi, M., Ramirez, M., Zehner, R. (2009). Cultural patterns in product design ideas: comparison between Australian and Iranian student concepts. *Design Studies*, 30, 438-461. doi: 10.1016/j.destud.2008.11.006

Roozenburg, N.F.M., Eekels, J. (1995). *Product Design, Fundamentals and Methods*: John Wiley & Sons, Chichester, UK.

Sanders, E.B.N., Stappers, P.J. (2008). Co-creation and the new landscapes of Design. *Codesign*, 4(1), 5-18.

Sardar, Z. (2012). *De Nederlandse Fiets/ The Dutch Bike*. Rotterdam: nai010 Publishers.

Schwartz, S.H. (1994a). Beyond individualism/collectivism: New dimensions of values. In U. Kim, H.C. Triandis, C. Kagitcibasi, S.C. Choi and G. Yoon (Eds.), *Individualism and Collectivism: Theory Application and Methods.* Newbury Park: Sage.

Schwarz, S.H. (1994b). Are there universal aspects in the structure and contents of human values. *Journal of social issues*, 50(4), 19-45.

Schwartz, S.H. (2006, p.0). *Basic Human Values: An Overview*. Jerusalem: The Hebrew University of Jerusalem. Retrieved December 2014, from http://scholarworks.gvsu.edu/cgi/viewcontent.cgi?article=1116&context=orpc

Siemerink, P., Rek, M., van Boeijen, A.G.C., Lee, YK., Lee, KP. (2010). Digital User Research in Korea. Defining Quality Factors for an internet-based research tool. *Proceedings of the Designing Interactive Systems 2010 Conference*, August 16-20, Aarhus, Denmark.

Sleeswijk Visser, F., Stappers, P.J., van der Lugt, R., Sanders, E.B.N. (2005) Contextmapping: Experiences from practice, *CoDesign: International Journal of CoCreation in Design and Arts*, I(2), 119-149.

Sleeswijk Visser, F., van der Lugt, R., Stappers, P.J. (2007) Sharing user experiences in the product innovation process: Participatory design needs participatory communication. *Journal of Creativity and Innovation Management*, 16(1), 35-45.

Sleeswijk Visser, F. (2009). *Bringing the everyday life of people into design*. Doctoral thesis, Delft University of Technology, Delft.

Snelders, D., Morel, K.P.N., Havermans, P. (2011). The cultural adaptation of web design to local industry styles: A comparative study. *Design Studies, 325*, 457-481.

Stappers, P.J. (2007). *Doing design as a part of doing research. Design Research, an oxymoron?* In R. Michel (Ed.), Design Research Now: Essays and selected projects, (pp. 81-97). Basel: Birkhauser Verlag AG.

Stappers, P.J., Hoffman, R.R. (2009). Once More, Into the Soup. *Intelligent Systems*, IEEE, 24(5), 9-13.

Stappers, P.J., Sleeswijk Visser, F., Keller, A.I. (2014). How do we Embark on Design Research? In P. Rodgers, Yee, J. (Eds.), *The Routledge Companion to Design Research*. London: Routledge.

Star, S., Griesemer, J.R. (1989). Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 19(3), 387-420.

Study Guide 2013/2014 (2013). Delft: Faculty of Industrial Design Engineering.

Tromp, N., Hekkert, P.P.M., Verbeek, P.P. (2011). Design for Socially Responsible Behaviour: A classification of influence based on intended user experience. *Design Issues*, 27(3), 3-19.

Trompenaars F., Hampden-Turner, C. (1998). *Riding the waves of culture; understanding diversity on global business*. New York: McGraw-Hill.

Unicef (1993). *VIPP: Visualisation in participatory programmes*. Bangladesh: Unicef.

van Boeijen, A.G.C. (1996). Development of Tricycle Production (DTP) in developing countries. In E. Brown, et al. (Eds.), *RESNA '96 Annual Conference: Exploring new horizons … pioneering the 21st century* (pp. 402-403). Salt Lake City, Utah, USA. – cited by Oosterlaken, 2009, p. 99.

van Boeijen, A.G.C., Flier, P., Oldenkamp, I., Toetenel, O., Vermeulen, R., Verweij, J. (1996). *Tricycle Production Manual*. Delft: Delft University of Technology-CICAT.

van Boeijen, A.G.C. (2007a). *Hoe worden gehandicapte kinderen in Ethiopië zelfredzaam?* O2 Magazine, 15, (pp. 24-27).

van Boeijen, A.G.C. (2007b). A manual as a catalyst. In M.C.A. v. d. Sanden, P. Baeten, C.J.C.C. Broeksmit, E.A.M. Esveld & L.E. d. Vlieger (Eds.), *You can't just blame the crocodile* (pp. 112-119). Delft: TUDelft.

van Boeijen, A.G.C., Badke-Schaub, P. (2007). Designing products in multi-cultural teams in the context of education. *Proceedings of the International Conference on Engineering and Product Design Education*, pp. 601-606. Newcastle Upon Tyne, UK.

van Boeijen, A.G.C., Stappers P.J. (2008). How can designers better incorporate cultural aspects in their designs for the Base of the Pyramid (BoP) … and why should they? *Proceedings of the DesignEd Asia 2008 Conference*, Hong Kong, China.

van Boeijen, A.G.C., Stappers, P.J. (2011a). Preparing Western designers for the use of Contextmapping techniques in non-Western situations. *Proceedings of the Engineering and Product Design Education Conference*, 8-9 September 2011, London, UK.

van Boeijen, A.G.C., Stappers, P.J. (2011b). Serving the under-served: What can designers learn from Rural Appraisal Techniques? *Proceedings of the International Association of Societies of Design Research conference*, 31 October - 04 November 2011, Delft.

van Boeijen, A.G.C., Stappers, P.J. (2012). Designers coping with culture in an educational setting. *Proceedings of Design Research Society*, 1-5 July 2012, Bangkok, Thailand.

van Boeijen, A.G.C., Daalhuizen, J.J., Zijlstra, J.J., van der Schoor, R.S.A. (Eds., 2013). *Delft Design Guide*. Amsterdam: BIS Publishers.

van Boeijen, A.G.C. (2013). Socio-cultural dimensions to sharpen designer's cultural eyeglasses. *Proceedings of the Engineering and & Product Design Education conference*, 5-6 September 2013, Dublin, Ireland.

van Rijn, H., Bahk, Y., Stappers, P.J. , Lee, KP. (2005). Three factors for context-mapping in East Asia: Trust, control and nunchi. *CoDesign* 2(3), 157-177.

Visser, T. (2012). *Designing awareness systems for social connectedness*. Doctoral thesis, Delft University of Technology, Delft.

Zimmerman, J., Stolterman, E., Forlizzi, J. (2010). An analysis and critique of Research through Design: Towards a formalization of a research approach. *Proceedings of the 8th ACM Conference on Designing Interactive Systems*, New York.

Websites

Archetype. (n.d.). In *Dictionary*. Retrieved from http://dictionary.reference.com/browse/archetype

Arup (2006). *Drivers of change*. Retrieved October 1, 2014, from http://www.driversofchange.com/make/research/doc/

Babybloom (n.d.). Retrieved October 1, 2014, from www.babybloom.nl

Design Council (2005). *The Design Process*. Retrieved October 1, 2014, from: http://www.designcouncil.org.uk/about-design/How-designers work/Thedesign-process

CultureGPS (n.d.). Retrieved October 1, 2014, from http://geert-hofstede.com/products.html

Frog (n.d.) *Activity Tool Kit*. Retrieved October 1, 2014, from http://www.frogdesign.com/work/frog-collective-action-toolkit

Hebi (n.d.). *Hemel Baby Incubator*. Retrieved October 1, 2014, from http://www.hebi-incubator.org

IDEO (2014). *Human-Centered Design Toolkit.* Retrieved April, 2014, from http://www.ideo.com/work/human-centered-design-toolkit

IDEO (n.d.). *IDEO Method Cards*. Retrieved October 1, 2014, from http://www.ideo.com/work/method-cards

International HIV/AIDS Alliance (2006). *Tools together now! 100 participatory tools to mobilise communities for HIV/AIDS.* Retrieved October 1, 2014, from www.aidsalliance.org

Peepoople (2014). *Peepoople*. October 1, 2014, from http://www.peepoople.com

PicoSol (2014). Retrieved October 1, 2014, from http://www.picosol.org/en/

van Huystee, M. (n.d.). *Mark van Huystee: Visualisation and Design*. 2014, from http://www.huystee.com/en/home.html

References – Cases

The i.do workshop case numbers refer to publications. I do 2010 workshop has not been published. The case numbers for JMP-BoP, GP-BoP and GP refer to the design students' reports.

1 – i.do workshops

Case 1-1
I do 2005 (2005). *I.do: The international Design workshop 2005*. Hong Kong: SD Press.

Case 1-2
I do 2008 (2008). *I.do: The international Design workshop* 2008. Hong Kong: SD Press.

Case 1-3
I do 2009 (2009). *I.do: The international Design workshop* 2009. Hong Kong: SD Press.

2 – Joint Master Projects – BoP

Case 2-1
Doubrovski, Z., van den Bos, H., van der Hout, M., van Toorenburg, H. (2008). *GhanaMoves project.* For Movendi Foundation and MakD, and the faculty of Industrial Design Engineering, Delft.

Case 2-2
Dinh, L., Koers, W., van Lier, H., van Rooijen, V., van Schie, P. (2009). *Redesign of the van Hemel Incubator.* For HEBI foundation, and the faculty of Industrial Design Engineering, Delft.

Case 2-3
Korthals M., Louwman J., Lysen W., Tolhuijs B., van Ginhoven, S. (2010). *Product and Business concept for the Peepoo sanitation bag for slums*. For Peepoo in Sweden, and the faculty of Industrial Design Engineering, Delft.

Case 2-4
Bunk H., Lotgering S., Molenaar N., Talsma L., Verhoef M. (2010). *Mobile learning centre device for Kenya.* For the Better Life Foundation, and the faculty of Industrial Design Engineering, Delft.

Case 2-5
Gehem, S., van Goudoever F., Greijdanus A., van der Werf J. (2010). *Skoon Lappie – Female Hygiene – South Africa*. For MKI foundation, and the faculty of Industrial Design Engineering, Delft.

Case 2-6
Hollenberg, N., van Klaarbergen, S., Rosenbrand, Ruijs, F., Visser, R. (2011). *Kauban: Creating a product for the Child&World Foundation to create employment for the residents of the Capitol Site Barangay, Cebu City, The Philippines*. For World&Child, and the faculty of Industrial Design Engineering, Delft.

Case 2-7
Plink, L., van Mastbergen, L., van der Liende, J., van de Linde, G. (2012). *Lighting up Nepal*. For Empower Generation, and the faculty of Industrial Design Engineering, Delft.

Case 2-8
Grau Jensen, J., Jansen, A., Migchelbrink, V., Veling, J. (2011). *The LINN design toolbox*. For ONergy, and the faculty of Industrial Design Engineering, Delft.

Case 2-9
Bouwman, M., Dukalski, R., van Dijk, J., Vereecke, B. (2012). *Designing refrigeration for the Philippines*. For Trade Without Borders, and the faculty of Industrial Design Engineering, Delft.

Case 2-10
Gokgoz, E., Ferreira de Sa, M., Perez, D., van Uffelen, F. (2012). *Empowering entrepreneurs for rural electrification.* For FACT Foundation, and the faculty of Industrial Design Engineering, Delft.

Case 2-11
Haagen, E., Martin J.D., van der Meer, C., van der Velde, N. (2012). *Developing a windmill with & for the farmers in India.* For GIAN in cooperation with the VentureStudio, and the faculty of Industrial Design Engineering, Delft.

Case 2-12
Bolier, L., Chao P.Y., Guadhe A., Suib, S. (2012). *Mobile technology to improve public healthcare system in Egypt.* For Ministry of Health & Population (MOHP), and the faculty of Industrial Design Engineering, Delft.

Case 2-13
Ballester, M., Kranenburg, A., Garcia van Gool, I.O., Paauwe, R. (2011). *Kisan.dat*. For DSM, and the faculty of Industrial Design Engineering, Delft.

Case 2-14
Ellis, F., Hock, M., Janszen, N., Waring, A. (2012). *Tackling Anemia through the design of a needle-free hemoglobin tool.* For Biosense, and the faculty of Industrial Design Engineering, Delft.

Case 2-15
Blomberg, F., Jagtman, F., Kooper, R. , Nijs, F., Wolfswinkel, L. (2012). *Food for thought: A sustainable way of cooking for The Gambia.* For Yep!Africa, and the faculty of Industrial Design Engineering, Delft.

3 – Graduation-BoP projects

Case 3-1
Boom, S. (2005). *Solar light*. For Kamworks, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-2
Bottema, R. (2006). *Personal water purifier.* For Vestergaard Fransen, Master thesis at the faculty of Industrial Design Engineering.

Case 3-3
Nguyen, M. (2006). *Safe drinking water*. For DSM, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-4
Ideler, L. (2006). *Adoptable woodstove for rural India.* For Philips, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-5
Huis in 't Veld, C. (2006). *Design of a malaria diagnostic device for India*. For Philips, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-6
Hoi-Kee Wong, S. (2007). *Cooking in rural China*. For Philips, Master thesis at the faculty of Industrial Design Engineering, Delft

Case 3-7
Munneke, K. (2007). *Better Brace Project*. For TTAF and Grarbet Thehadeso Mahber in Ethiopia, Master thesis at the faculty of Industrial Design Engineering, Delft

Case 3-8
van Diessen, T. (2008). *Solar Home System for Cambodia*. For Kamworks Cambodia, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-9
Arik, D. (2008). *Personal digital healthcare assistant*. For Intel, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-10
van Driel, J. (2009). *Cultural aspects in BoP graduation projects*. Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-11
Sung K. (2010). *Needs assessment of BoP customers in Southern Sudan on health, water and sanitation.* For Basic Building for People Foundation (BB4P), and BB-con, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-12
Martens, J.R.J. (2010). *Design of a user centered Solar Refrigerator.* For SolarBear, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-13
Tijs, R. (2010). *Bang-Bang from Hell: Product for humanitarian land mine clearance*. For Lectron BV, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-14
Bazoli, G. (2011). *Designing an educative program about menstrual symptoms and a sanitary napkin life-cycle redesign for rural Indian women.* For Deepak Foundation, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 3-15
Brutto, F. (2011). *PAMOJA: Oral Health Education within Kenyan Vulnerable Communities*. For Jukumu Letu, Master thesis at the faculty of Industrial Design Engineering, Delft.

4 – Graduation projects

Case 4-1
Zeijlstra C. (2006). *A wood stove for the Western camping market*. For Philips Research Laboratories, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 4-2
Akil, R.M. (2008). *Story telling device.* For Mediamatic, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 4-3
Pries, J.F.F. (2011). *Safe-haven: Creating a better crew-rest experience.* For Hogeschool Utrecht and Driessen, Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 4-4
Dong, M. (2012). *What Challenges Dutch Design in China? Towards a supportive tool for Dutch Designers and Design managers and their Chinese co-workers*. Master thesis at the faculty of Industrial Design Engineering, Delft.

Case 4-5
Li, L. (2013). *Care you more: Design for interactions between the Dutch cabin crew and the Chinese passengers.* For Royal Dutch Airlines (KLM), Master thesis at the faculty of Industrial Design Engineering, Delft.

Glossary

Anthropology (cultural)	Anthropology is the science of humanity. Cultural anthropology is the comparative study of the manifold ways in which people make sense of the world around them.
Archetype (product)	A basic model of a product, representing the main characteristics of a product class.
Base of the Pyramid (BoP) projects	The term Base – or bottom – of the Pyramid project, first introduced by Prahalad (2005), refers to the majority of the world's population that earns less than two US-dollars purchasing power parity per day. BoP projects aim to develop products and product-service systems that enhance the lives of the poorest people in the world.
Behaviour	The range of people's actions or mannerisms. In a product-user relationship, it refers to the actions people perform: for example, some people chew on their pen while thinking when writing.
Blind spots	The things that you do not know you do not know. The things that you know that you do not know are *questions*. The things that you do not know that you know are part of *tacit knowledge*, while the things you know that you know are part of *explicit knowledge*.
Boundary object	Objects that represent abstract or concrete information, and that are common enough to be understood and used by people from different disciplines, and specific enough to be meaningful for each specific discipline, but in their own way. These objects support social interactions involving people from different social groups. Star and Griesemer (1989) introduced the concept of boundary object.
Card sorting	A participatory design technique that can be used to explore participants' needs and wishes. The cards encourage storytelling, and make it possible to categorise and prioritise topics.
Context (user)	The factors that surround the intended user or group of users, and that influence the meaning that they give to a product. These factors can be physical and concrete, such as climate and the things intended users possess, as well as non-physical, such as political issues and religious beliefs.

Contextmapping	Design method used to gain insights and to deepen understanding regarding the context in which people use products on a day-to-day basis. Through a series of generative sessions, designers gain insights into their intended users' level of knowledge, as well as into their feelings and deepest wishes.
Convention	A convention is a set of agreed upon, stipulated, or generally accepted standards, norms, social norms, or criteria, often taking the form of a custom. (Wikipedia, accessed July 2014) http://en.wikipedia.org/wiki/Convention_(norm)
Credibility	The quality of being believable or inspiring trust; the extent to which one is trustworthy and has the appropriate expertise.
Cross-cultural	Between two or more cultures.
Cultural dimensions	A set of measures along which cultural values can be analysed.
Cultural probes	Cultural Probes is a technique for learning about intended users in a purely inspirational way based on their self-documentation. Intended users are provided with generative packages – that is, probes – that help them to record daily life experiences.
Culture	The system of shared beliefs, values, customs, habits, behaviour, and artefacts that members of a society use to cope with their world and with one another, and that are transmitted from generation to generation through learning.
Culture shock	The personal disorientation a person feels when experiencing an unfamiliar way of life in a specific situation: for example, when visiting another country or social group.
Culture-conscious design	The process in which possible roles played by the intended users' culture are known to the designer, and are taken into account in her or his conceptualisation of products related to the product-user interaction or to the user's experience.
Design	The description of a product or product service. Depending on the stage and the extent of its development, the design can be manifested differently: for instance, as an idea, a principle solution, a concept, or a materialised design.
Design goal	The design results or achievements towards which the design efforts are directed.

Design research methods	The methods used by designers in a design project. They may overlap with methods used in scientific research, but not necessarily.
Designing	The activity of thinking and articulation that leads to the creation of a design.
Dimension	An aspect of a culture that can be measured relative to other cultures (Hofstede 2005, p. 23).
Emic	Knowledge and interpretations that exist within a culture, and that are 'determined by local custom, meaning, and belief' (Ager and Loughry, 2004: n.p.) and best described by a 'native' of the culture. (Wikipedia, accessed June 2014) http://en.wikipedia.org/wiki/Emic_and_etic
Empirical reality	Reality that can be deduced from repeatable observations by way of the senses.
Ethnography	Descriptive study of a particular human society, based on research in the context of the targeted people's lives.
Etic	Knowledge that refers to generalisations about human behaviour that are considered universally true, and that commonly links cultural practices to factors of interest to the researcher, such as economic or ecological conditions, that cultural insiders may not consider very relevant (Morris et al., 1999). (Wikipedia, accessed June 2014) http://en.wikipedia.org/wiki/Emic_and_etic
Framework (theoretical)	A logical representation of the concepts, variables, and relationships involved in a scientific study, the purpose of which is to identify clearly what will be explored, examined, measured, or described. It serves as a 'lens' to study the research topic.
Function – primary	A product's ability to be used because of its material utility value; in principle, the basis of each product's origin (Muller, 2001, p. 339).
Function – secondary	A product's ability to be used because of its socio-cultural utility value; secondary functions are an extension of or originate in primary functions (Muller, 2001, p. 339).
Habits	Routines of behaviour that are repeated regularly and that tend to occur subconsciously. In a product-user relationship, the term refers to the actions that people perform in a specific situation at a specific time: for example, starting the day by drinking a cup of tea or coffee.

Heroes	Persons – alive or dead, real or fictional – that have specific significance for a group, such as Nelson Mandela for the world, Harry Potter and Voldemort for children, and Steve Jobs for designers. They are role models for a specific group, and represent particular values.
Identity (cultural)	Set of characteristics of a specific group of people. Through these characteristics, the group can be recognised and identified. The identity can be an *ascribed* one, based on fixed characteristics such as age and gender, or an *achieved* one, based on what members of the group do, on how they behave and act, and on the products that surround them.
Identity (individual)	A set of characteristics addressed to an individual person. Through these characteristics, the person can be recognised and identified. The identity can be an *ascribed* one, based on fixed characteristics such as age and gender, or an *achieved* one, based on what the person does, how she or he behaves and acts, and on the products that surround her or him.
Insider	A person who is a member of – belongs to – the studied culture.
Intended users	Users that the designer is focusing on when designing the product.
Intention (design)	A specific goal that is aimed at by the designer.
International master students	Students who are following a master degree programme in one country, but were raised and educated – at least until completing their bachelor degree – in another country.
Lifestyle	The typical way of life of an individual person or group, expressed by how they typically act or behave, and by what products (including furniture and clothing) they typically surround themselves in a specific context. People who share the same lifestyle do not necessarily share the same individual identity, such as age and profession.
Model (theoretical)	A representation of a theory that can be applied in research and/or in the design process.

Norms (cultural)	Norms are specific rules for behaviour that are applied in specific situations. While norms are standards, patterns, rules, and guidelines relating to expected behaviour, values are abstract concepts having to do with what is important and worthwhile. For example, waiting to begin one's meal before everybody has been served is a norm, but it reflects the value of togetherness.
Onion model	Hofstede's model: Representation of layers of the concept of culture, distinguishing 'values' as the core of culture and 'practices' as the manifestation of these values.
Outsider	A person who is not a member of – does not belong to – the studied culture.
Probe	An exploratory action, expedition, or device, especially one designed to investigate and obtain information about a remote or unknown region. (The Free Dictionary, accessed August, 2014) http://www.thefreedictionary.com/probing
Participatory Rural Appraisal	PRA represents an approach that consists of a variety of techniques to extract qualitative data, the purpose of which is to facilitate understanding and to contribute to the lives of people in impoverished rural areas. It also encourages these people to participate more fully in their development.
Personas	Personas are archetypal representations of intended users, describing and visualising their behaviour, values, and needs. Personas help designers to become aware of and to communicate these real-life patterns of behaviour, values, and needs in their design work.
Product	The final result of the creation of a design, manifested in various forms: for example, a tangible device or a non-tangible service.
Rapid Rural Appraisal	RRA represents an approach that consists of a variety of techniques to extract qualitative data, the purpose of which is to facilitate understanding the lives of people in impoverished rural areas.

Ritual	A stereotyped sequence of activities performed in a specific situation in time and place, repeated over time, and designed to support shared social values. In a product-user relationship, it refers to the actions people perform to maintain specific values: for example, a tea ceremony can serve to perpetuate the importance of harmony within humanity and with nature, to foster the notion of a disciplined mind and a heart in balance, and to ease the path to enlightenment.
Routine	A routine is a type of learned behaviour that is bound to a certain time frame and is repeated regularly, and is therefore carried out unconsciously. For example, having breakfast can be a routine, involving the same behaviour every day. Going to bed at or by a fixed time each night can also be seen as a routine.
Socio-cultural dimensions	Social value constructs that can be used to typify a specific culture in order to contribute to culture-conscious design.
Stereotype	A simplified and/or standardised conception or image having specific meaning. A stereotype can be a conventional and oversimplified conception, opinion, or image, based on the assumption that there are attributes that members of the group hold in common.
Style (design)	Classification of products by their abstract meaning – such as *playful* and *feminine* – and the related formal elements, such as *colours, forms, texture*, and *materials*.
Subculture	A group of people within a culture that differentiate themselves from the larger culture to which they belong.
Symbols (cultural)	Representations of shared values, transmitting a specific meaning for a specific group in a particular context. For example, a red rose given by one person to another on Valentine's day expresses love, as does a red heart on a greeting card. The same heart on a card in a poker game, however, has a different meaning. (A further example is the Swastika, which is in fact an ancient and positive symbol of prosperity and good luck, but in the mid-19th century it became a symbol of radical nationalism, eventually associated with death and hatred.)

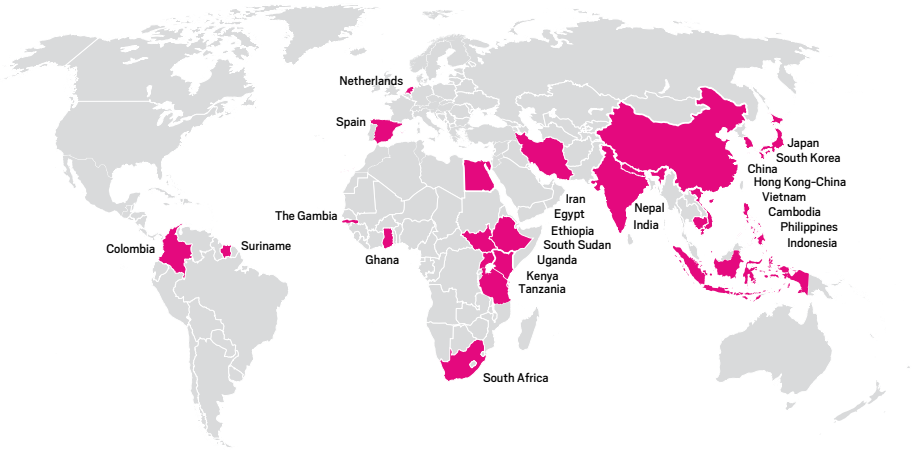
Symbols (Hofstede's onion model)	Words, gestures, images, and objects manifested in a specific group, and may include products, services, art, dialect, and so on. They are expressions of culture that are mostly on the surface and can be observed.
Theory	A set of statements or principles devised to explain a group of facts or phenomena, especially ones that have been tested repeatedly, or are widely accepted and can be used to make predictions about natural phenomena.
Trust	Firm reliance on the integrity, ability, or character of a person, a group of people, or a thing.
Value (cultural)	Broad tendencies in a group to prefer certain states of affairs above others; they are more valuable or important. Values are about behaviour that is desired or aspired to. They are about 'what should' and 'what should not'; people learn them as children, and apply them gradually in practice.

Abbreviations

ACD	Advanced Concept Design (IDE master course)
BoP	Base of the (economic) Pyramid
C&C	Context and Conceptualization (IDE, master course)
CICAT	International Development Cooperation Office
CMT	Contextmapping techniques
CoC	Circuit of Culture
DCI	Design and Cultural Impact (IDE bachelor elective course)
DCS	Design Culture and Society (IDE master course)
DP	Design practitioner
DTP	Development of Tricycle Production
DUT	Delft University of Technology
DFI	Design for Interaction (IDE master)
FDC	Food Design and Culture (IDE master elective course)
GD	Graphic designer
GP	Graduation Project (IDE master)
i.do	International Design Opportunity, workshop in Hong Kong
IDE	Faculty of Industrial Design Engineering in Delft
IDV	Individualism versus Collectivism (2nd cultural dimension, Hofstede)
ILO	International Labour Organization
IND	Indulgence versus Restraint (6th cultural dimension, Hofstede)
IPD	Integrated Product Design (IDE master)
IW	International workshop
JMP	Joint Master Project (IDE master course)
LTO	Long versus short Term Orientation (5th cultural dimension, Hofstede)
MAS	Masculinity versus Femininity (3rd cultural dimension, Hofstede)
NGO	Non Governmental Organization
PDI	Power Distance (1st cultural dimension, Hofstede)
PRA	Participatory Rural Appraisal
PPP	Purchasing Power Parity
RRA	Rapid Rural Appraisal
SPD	Strategic Product Design (IDE master)
ToP	Top of the (economic) Pyramid
UAI	Uncertainty Avoidance (4th cultural dimension, Hofstede)

Appendix 1 – Cases

Overview of the workshops, projects and essays (Chapter 3)



1 – i.do = international design opportunity: Hong Kong summer course workshop
2 – JMP-BoP = Joint Master Projects in a BoP context: IDE master course
3 – GP-BoP = Graduation Projects in a BoP context: IDE master final project
4 – GP = Graduation Projects: IDE master final project
5 – C&C essays = Context & Conceptualization: IDE master course with an essay as sub-assignment

No* = Numbers of designers

C = Coaching: As a design coached the author of this thesis monitored and guided the project
R = Report: An overview of the design project process and intermediate and final results
I = Interview: 1-1,5 hour interview, semi-structured, recorded
Q = Questionnaires

Models studied
O = Onion model (Hofstede, 2005)
D = Dimensions (Hofstede, 2005)

v = Applicable in the corresponding workshop, project, essay or course

Case	No.*	Year	No.	Topic	Country	C	R	I	Q	O	D
1 – i.do workshops (4)	17	2010	4	supporting aging by products	Hong Kong-China	–	–	v	v	–	–
	16	2009	3	supporting aging by products	Hong Kong-China	–	–	v	v	–	–
	16	2008	2	hotel service	Hong Kong-China	–	–	v	v	–	–
	20	2005	1	public transport devices	Hong Kong-China	–	–	v	v	–	–
2 – JMP-BoP (15)	5	2012	15	cooking stove	The Gambia	v	v	–	–	–	–
	4	2012	14	anaemia diagnostic device	India	v	v	–	–	–	–
	4	2011	13	farmer data collection system	India	v	v	–	–	–	–
	4	2011	12	mobile healthcare system	Egypt	–	v	v	v	v	v
	4	2011	11	windmill for salt farmers	India	v	v	–	–	–	–
	4	2011	10	electricity supply system	Uganda	–	v	–	v	–	–
	4	2011	9	solar refrigerator	Philippines	–	v	–	v	–	–
	4	2011	8	toolbox for solar lighting	India	–	v	v	v	–	–
	4	2011	7	solar light	Nepal	–	v	–	–	–	
	5	2011	6	coffin	Philippines	v	v	–	–	v	–
	4	2010	5	feminine hygiene product service	South Africa	v	v	v	v	v	v
	5	2010	4	mobile learning centre	Kenya	v	v	v	v	v	–
	5	2010	3	sanitation service	Kenya	v	v	v	v	v	v
	5	2009	2	baby incubator	Kenya	v	v	v	v	v	v
	4	2008	1	tricycle	Ghana	v	v	–	–	v	v
3 – GP-BoP (15)	1	2011	15	oral hygiene product service	Kenya	v	v	–	–	–	v
	1	2011	14	feminine hygiene product service	India	–	v	v	–	–	v
	1	2010	13	mine clearance device	Cambodia	v	v	–	–	–	–
	1	2010	12	solar refrigerator	Suriname	v	v	–	–	–	v
	1	2010	11	school sanitation	South Sudan	v	v	v	v	v	v
	1	2009	10	5 BoP-GPs reviews	Netherlands	v	v	–	–	–	–
	1	2008	9	diabetes assistant	India	v	v	v	v	–	v
	1	2008	8	solar home system	Cambodia	v	v	–	–	–	–
	1	2007	7	better brace	Ethiopia	v	v	v	–	–	–
	1	2007	6	cooking stove	China	–	v	–	–	–	–
	1	2006	5	malaria diagnostic device	India	v	v	–	–	–	–
	1	2006	4	cooking stove	India	–	v	–	–	–	–
	1	2006	3	water purifier	India	–	v	–	–	–	–
	1	2006	2	water purifier	Ghana	–	v	–	–	–	–
	1	2005	1	solar light	Cambodia	–	v	–	–	–	–
4 – GP (5)	1	2013	5	Chinese passengers-crew interaction	Netherlands-China	v	v	–	–	–	–
	1	2012	4	designing for China	Netherlands-China	v	v	–	–	–	v
	1	2011	3	rest cabin for airplanes	International	v	v	–	–	–	v
	1	2008	2	migrant stories	Netherlands	v	v	–	–	v	–
	1	2006	1	camping woodstove	Netherlands	v	v	–	–	–	–
5 – C&C essays (17 + 14)	31	2010	2	essays	various countries	–	v	–	–	–	–

Overview of the workshops, projects, and courses (Chapter 4)

1 – IW = International Workshop: IDE introduction for international students
2 – DCI = Design and Cultural Impact: IDE bachelor elective course
3 – FDC = Food Design and Culture: IDE master elective course
4 – JMP-BoP = Joint Master Projects in a BoP context: IDE master course
5 – DCS = Design, Cultural and Society: IDE master course
6 – GP-BoP = Graduation Projects in a BoP context: IDE master final project
7 – DP = Design Practitioner

Case	No.*	Year	Topic	C	R	I	Q	O	D
1 – IW	30	2010	investigation with onion model	-	-	-	-	v	-
	30	2009	investigation with onion model	-	-	-	-	v	-
2 – DCI	ca. 100	2011	investigation with dimensions	-	-	-	-	-	v
3 – FDC	5	2013	investigation with models and cards	v	v	v	-	v	v
	25-30	2012	investigation with models and cards	v	v	-	-	v	v
	25-30	2011	investigation with models and cards	v	v	-	-	v	v
	25-30	2010	investigation with models and cards	v	v	-	-	v	v
	5	2009	investigation with models and cards	v	v	-	-	v	v
4 – JMP-BoP	16	2009	evaluation of the cards	-	-	-	v	v	v
5 – DCS	11	2013/2014	evaluation of the cards	-	-	-	v	v	v
6 – GP-BoP	1	2013/2014	evaluation of the cards	-	-	v	-	v	v
7 – DP	1	2013/2014	evaluation of the cards	-	-	v	-	-	v

Appendix 2 – Summary of Stage A publications

1 – (van Boeijen and Badke-Schaub, 2005)

This paper is based on five group interviews and 20 questionnaires (20 students in total).
The main questions were:

1 Do product designers' cultural values differ from the average cultural values of their country, defined by Hofstede's five dimensions? If yes, how do they differ?
2 Do designers from different countries share common values as defined by Hofstede's five dimensions?
3 In multicultural teams, does the cultural background influence the design process and the product?

During an international workshop involving four design teams, the relationship between the 'cultural profile' of individual design students and their design processes and design results was explored. The study revealed that cultural dimensions do influence design behaviour; the 'cultural profiles' of the design students per country differed from the profiles of their own country. However, barriers identified in communication, teamwork, and design methods could still be explained in terms of Hofstede's cultural dimensions. Cooperation between students with different 'cultural profiles' led to global solutions; it was not possible to distinguish design solutions that originated in the context of cultural differences.

- The study helped to develop the scope of the concept of culture. In principle, the dimensions were considered to be a good model to typify culture and to explain identified barriers.

2 – (van Boeijen, 2005)

This article is based on the analysis of a design report and an interview with one design student.
This student had developed a better brace for handicapped children in Ethiopia. He had also developed three scenarios within which to approach the project: Scenario 1 – local design and local production; Scenario 2 – local design produced in an ongoing collaboration with other national and international parties; and Scenario 3 – universal design, external production, and local modifications. The designer was careful in selecting the first scenario. Practical aspects, such as the availability of skills and knowledge, were taken into account. Although cultural values and possibilities for design were somewhat more random because of the limited time, priority was given to the technical functioning of the design.

- The study demonstrated the complexity of a BoP project, as well as the designer's considerations after not having taken cultural values into account.

3 – (van Boeijen and Stappers, 2008)

This study is an evaluation involving ten BoP project results (from reports), based on the question:
How does culture play a role in product design in the BoP domain?
The first four elements of Hofstede's theory (2005) were used: (i) the definition of culture; (ii) the levels of culture; (iii) the multi-layered manifestation of culture; and (iv) a multidimensional approach to compare cultures. An underlying question had to do with whether the elements could be used to identify useful cultural values to be implemented by designers.

- The study showed that the elements were indeed useful for the review of cultural aspects in BoP projects; however, they do not yet appear to be sufficient and accessible enough for designers. Nevertheless, as a lens, they helped in the evaluation of culture-specific aspects. And for some students, they appeared to be helpful for studying user needs and to generate ideas.
- For several reasons, design students often did not take cultural aspects into account: for instance, they focused on other aspects; there was a mismatch or a gap between interested parties; or the student designer lacked the necessary set of skills.

4 – (Arik, van Boeijen, and Kandachar, 2009)

This study is an evaluation of one international design project.
The paper proposes eight design guidelines for future designers in the field of technology, based on the design of a mobile application that supports healthy behaviour to reduce diabetes-related risks. A Turkish design student for a multinational company located in India conducted the project, and most guidelines were based on universal principles of human behaviour. Some included a culture-specific observation: namely, in collectivist cultures in particular, the situation is more complex. Kreuter and Haughton (2006) suggest that in collectivist cultures, the emphasis is less on the individual, more on the group, and people prioritise the needs of others before their own (selflessness), which resulted in the idea of including friends or family in the use of the application. Furthermore, the product should make use of easy qualitative representations and input of data, because in India – where people had little quantitative knowledge regarding diabetes management – doctors and dieticians did not mention many numerical information when they were advising diabetes patients about diet.

- The study showed that most insights were based on universal principles, and only a few were associated with culture-specific considerations. The student designer was interviewed immediately after finalisation of the project. The transcription of this interview was analysed in stage B, together with other data.

5 – (Akil, van Boeijen, and Boess, 2009)

This paper reports on a design project that sought to facilitate migrant culture video storytelling. The result was a design concept, 'the Storybooth', which

facilitated interactions between two persons, engaging with each other in the storytelling. The Storybooth aimed to inspire its users to tell their personal stories by means of StoryDice and a screen interface. As an alternative to objects, keyword stimulants were used to inspire the user. In a test, they were found to generate stories within the 'value layer' of Hofstede's onion model, which generated more interesting stories than did images or objects. The keywords derived from the onion layers where applied in the form of two dice, one with nouns and one with adjectives.

- The study showed that migrant culture storytelling could be facilitated by value-based stories, side-by- side interaction, telling stories to a listener, and inspiration from keywords, as embodied in the Storybooth concept. However, usage evaluation showed that many of the stories were still personal ones of a more universal nature rather than specific cultural expressions. This was because although the words were chosen from the onion-model layers, they were not directed towards a specific cultural context.

6 – (van Boeijen and Stappers, 2011)

The aim of this study was to determine how to prepare design students for the use of contextmapping techniques in non-Western cultures. The main questions were:

1 What barriers do students encounter when applying CMTs in BoP projects, and how can we understand these barriers in terms of a cultural framework?
2 What possibilities do students come up with to improve the effectiveness of their CM sessions?
3 How can we better equip our students who prepare CMTs for their BoP projects?

Five JMP-BoP projects were selected and, together with 17 C&C essays, were evaluated. Six barriers were found and turned into general guidelines. The six guidelines were made operational by linking them to three main aspects of contextmapping: (1) selection of participants; (2) design of topic, materials, and sessions; and (3) roles and attitude of facilitators. For each aspect, operational instructions were defined for design students preparing their BoP projects.

- The study helped to develop an understanding of how Hofstede's dimensions could be used to explain identified barriers, and to use them as guidelines for the preparation of participatory sessions.

7 – (van Boeijen and Stappers, 2011)

This paper presents a comparison of rural appraisal techniques with context-mapping techniques. The study is based mainly on a study of the literature and 14 C&C essays, and resulted in five guidelines for designers relating to (1) the empowerment of people; (2) materials and locations; (3) time; (4) biases; and (5) outsiders' attitudes. The developers of rural appraisal techniques emphasise the importance of a bottom-up approach in which local people

play a leading role in their own development. Design approaches are moving more in this direction.

- The study confirmed the importance of understanding the local context and the role that intended users should play. The developers of rural appraisal techniques do not provide answers on how to deal with cultural values (for example, identifying them, or on how to deal with conflicting cultural values).

8 – (van Boeijen, 2012)

This paper presents the results of a qualitative study examining how design students deal with culture in a series of international design workshops. It includes results from a study published earlier (van Boeijen and Badke-Schaub, 2005). This paper is based on 18 group interviews and 51 questionnaires (69 students in total). We wanted to determine three things:

1 To what extent do design students from different countries share common cultural values?
2 What difficulties do design students encounter in these types of workshops, and what techniques and strategies do they use to deal with cultural barriers?
3 What opportunities do they identify with regard to attending this type of workshop?

The study illustrated barriers that could be explained in terms of different cultural values. The design students came up with various solutions to overcome obstacles; however, they needed extra time to rethink the design approach; to develop rules and norms for cooperation; to understand each other's frame of reference when studying their intended users; and to understand the degree of acceptance of their designs. They also needed additional time to learn to accommodate diverse approaches held by their team members. We concluded that the discussion among students on the manifestation of the design and its cultural impact was underexposed, and that there were many opportunities for educators to provide students with tools and techniques that would support them in dealing with cultural values.

- The study offered particular insight into how Hofstede's dimensions could be used to explain barriers, to identify opportunities, and, consequently, to understand what designers might need in a project in which they are unfamiliar with the culture of their intended users.

9 – (Pries, van Boeijen, and van der Lugt, 2012)

The aim in this case study was to explore how to do contextual research in a remote and global context, in which cultural issues might play an important part. We executed and evaluated a design project on a flight-cabin crew-rest area. In this paper, by engaging non-professionals in the research, a design research method is laid out to obtain information from global users about their experiences involving design projects. We found that this collaborative way of doing design research can be very effective, but requires the involvement of co-researchers throughout the various research activities, and beyond simply collecting data.

- The study showed the possible limitations that a designer needs to deal with regarding the cultural study of his/her intended users. The project demonstrates how cultural models have been used both to understand possible cultural differences between intended user groups (crews) and to develop a design direction. These results from the report have been used further in Stage B and reported in Chapter 4.

Appendix 3 – Card set: design criteria

1 – Meaning

1.1 The card set should have a specific name that can be referred to (aim: the set will have its own identity).

1.2 The style of the card set should be professional; users (designers) should be able to judge the tool's credibility positively, and trust the relevance of the content (aim: designers perceive the card set to be credible).

1.3 The style of the card set should be playful; users should feel inspired, and free to read the tool and use the suggestions (aim: designers are motivated to use the card set).

1.4 Visuals on the cards should have a print quality of 300 dpi (aim: designers perceive the card set to be credible).

1.5 The cards should be designed according to AIDA[17] (aim: motivate designers to use the card set).

1.6 The card set should stimulate ownership (aim: motivate designers to use the card set more than once) (Sleeswijk Visser et al., 2007).

2 – Content

2.1 The content covers three areas (see also Figure A2-1):

- Why? – It should make designers aware of the relevance of culture-conscious design;
- What? – It should provide the designer with a lens to examine the target culture;
- How? – It should support the designer by means of methods and tools to study the culture of intended users.

2.2 The card set should be accompanied by suggestions on how to use it (e.g. possibly a procedure description or a manual).

[17] The AIDA principle refers to four stages: Attraction, Interest, Desire, and Action. To incorporate the four effects, a graphic design should adhere to the following principles:

1 – The graphic should have multiple layers of information, each with different functions, in order to satisfy people who simply need the overview, or those looking for more in-depth insights;

2 – The graphic should be able to capture viewers' attention, and lead them through the different layers;

3 – The graphic should have abundant information that encourages viewers to revisit and to be continually inspired.

the tool: 3 categories + content

Why? Designers' reasons for studying culture		What? Designers' knowledge relating to the study of culture		How? Designers' activities relating to the study of culture	
To avoid blind spots and more	Section	A lens to look at culture in the context of a design project	Section	Methods, tools and tips to examine the cultures of the intended users	Section
To avoid mismatches between product and users	3.4	Distinctions of designers' concerns (reasoning model)	3.3	Set boundaries, determine the cultural group	3.4
To know one's own personal and cultural values in order to deal with external influences	3.4	Distinctions between personality, culture and human nature (definition of culture)	3.4	Compare cultures	3.4
To generate new ideas (cultural differences as a source of inspiration)	3.4	The importance of boundaries relating to the cultural group	3.4	Tune participatory methods	3.5
To go from local to global designs or vice versa (to bridge cultures)	3.4	Values: cultural values and practices	4.2	Use dedicated tools (preference booklets, family cards, workbooks)	3.5
To rethink local values, which opens up the design space	3.4	Socio-cultural dimensions to generate culture-specific questions, to analyse and synthesise	4.3	Use a variety of tools (observations, interviews, role-playing, photo-elicitation, product confrontation)	3.5
To bridge cultural chasms in participatory sessions	3.5	Cultural values and other values	4	Ask permission, be attentive to reciprocity and manage expectation of intended users	3.5
To understand the meaning of desktop findings for a specific culture	3.5	The designer's concerns	4	Generate culture specific questions and ideas (socio-cultural dimensions and onion model)	4.3
				Sensitise regarding other cultures (onion model)	4.2
				Compare cultures	4.2
				Learn from the past	4.2

Figure A3-1 Content for the card set, based on findings presented in Chapters 2, 3, and 4

3 – Usability

3.1 The card set should provide an overview of the content and of how the cards are related (aim: designers have easy access to information).

3.2 The card set should be flexible, having a modular design to make it possible to extend the content with new material (aim: high utility value).

3.3 Structure and order: each card should have the name of the set, category, number, and an image to memorise, in order for users to be able to refer to the set and to determine whether it is complete (aim: high utility value).

3.4 Photos should be authentic to avoid stereotyping (aim: designers can understand the cards easily, and the content is credible).

3.5 The cards should be coherent, having the same structure and the same balance between visualisations and text in order to make them uniform (aim: designers have easy access to information).

3.6 Text and visualisations should be balanced and coherent (visuals support text) (aim: designers can easily find and understand information).

3.7 Designers in international teams should be able to understand the symbols (aim: the card set can be easily understood by international design teams).

3.8 The form of the visualisations should be in keeping with their functions according to Levin's categories[18] (Levin, 1987) (aim: the card set is attractive, and can be easily understood).

3.9 Each card should be used independently of the others (i.e. if one element is lost, the set should still be useful) (aim: the set can be updated, and the cards can be used in the long term).

[18] Levin (1987) examined and divided the functions of visualisations associated with text into five categories, each having a different level of learning effect:

- Decorative pictures are at the lowest level, and have no relation to the issue, which makes the text more attractive;
- Representational pictures are at a higher level, and illustrate the same meaning of the text in a concrete manner by providing a visual explanation;
- Organisational pictures attempt to make text more coherent and structured, and are usually organisational framework images. Exploded view and storyboards fit into this category;
- Interpretation pictures go a step further. They may be similar to the organisational pictures, but are intended to clarify text that is abstract or difficult;
- Transformation pictures represent the highest level, as mnemonic devices link the information to the pictures, which makes the text easier to remember.

Appendix 4 – Cultural dimensions

Hofstede et al. nations, regions, partly in a business context	House et al. nations, regions, managers of organizations and societies	Trompenaars et al. nations, regions, business-management context	Peterson business context	New design context
1 – Power Distance (PDI)	1 – Power Distance	Part of other dimensions, Achievement versus Ascription	1 – Equality and Hierarchy	1 – Hierarchy high-low
2 – Individualism versus Collectivism (IDV)	2 – Collectivism 1: Institutional Collectivism	1 – Individualism versus communitarianism	2 – Individual and Group	2 – Identification individual-together
	3 – Collectivism 2: In-Group Collectivism			
3 – Masculinity versus Femininity (MAS)	4 – Gender Egalitarianism	2 – Achievement versus Ascription	3 – Task and Relationship	3 – Gender separated-equal
	5 – Performance Orientation			4 – Aim care-achievement
	6 – Humane Orientation			
4 – Uncertainty Avoidance (UAI)	7 – Uncertainty Avoidance	4 – Universalism versus Particularism	4 – Risk and Caution	5 – Truth absolute-contextual
	8 – Assertiveness	3 – Neutral versus Affective	5 – Direct and Indirect	6 – Expression neutral-emotional
5 – Long Term Orientation (LTO)	9 – Future Orientation	5 – Attitudes to time	No similar dimension	7 – Time past-present-future
6 – Indulgence versus Restraint (IVD)	Related to Assertiveness	Related to Neutral versus Emotional	No similar dimension	8 – Attitude fun-duty
No similar dimension	No similar dimension	7 – Specific versus Diffuse	No similar dimension	9 – Space private-public
No similar dimension	No similar dimension	8 – Attitudes to the environment	No similar dimension	No similar dimension

Table A4-1 Overview of a comparison of four sets of dimensions from cultural theorists. The right column shows the proposed set for designers.

Appendix 5 – JMP-BoP and GP-BoP cases questions

Reflection & Evaluation (confidential)

Facts

Name
Nationality (grown up in…)
Languages (speaking)
Name organization/company
Country
Name project
Start date
End date
Fill in date

1 What was your personal motivation when you started this project? Please, prioritize (1=highest, 2, 3…).

Motivation	Remark	Priority
1 – Fortune	something to win such as status, money, goods	
2 – Escape	to be somewhere else, not where you normally are	
3 – Adventure	to meet the unknown, unexpected moments	
4 – Learn	to gain knowledge and develop skills	
5 – Help	to support others, to feel useful, to make a difference	
6 – Solving problems	to work on concrete, often technical problems	
7 – Challenge	to face difficulties, testing own knowledge, skills and attitude	
8 – Differences	to enjoy differences that stimulate creativity	
9 – Understanding	to understand yourself, own background through differences (reflection)	
10 – Other?	…	

2 Did you experience **differences** between design projects for the BoP context and the non-BoP context? If yes, please explain.

Checklist	No	Little	Yes	How?
Project management (time, order...)				
Communication				
Creating a design goal				
Creating product ideas and concepts				
Decision and selection				
Evaluation of product features				
Design results				

3 Which **design methods** did you use in the project? And did they work out well or not? Why? Why not?

4 What **surprised** you? Something you did not expect (think of a specific event, an interaction, a fact, can be more a 'top 3' of surprises)

5 Please indicate the frequency (or importance) in your project of the issues mentioned below.

	Frequently	Usually	Sometimes	Rarely	Never
Product is *affordable* for the intended buyers					
Intended users have *access* to the product					
The product is *reliable*					
Intended users *accept* (use) the product as intended					

6 What went **wrong** or was not as you like? How can/could it be improved or changed in a, for you, desirable way? (top 3?)

7 About what went **well** in your opinion? Is/was something needed to keep it like that? If not, what was needed? (top 3?)

8 What do you now realize that is **missing** in your preparation and educational background? (think of specific information, materials, objects, activities). Try to be specific, not too general. (top 5?)

9 To what extent culture was important in your project?
scale 1 (lowest) – 10 (highest)
In what sense and related to what?

Checklist	1	2	3	4	5	6	7	8	9	10
Understanding the context										
Design methods & techniques										
Design management (including communication)										
Product design manifestation										

10 What questions did you ask in your project related to culture and how did you find the answers? Specific methods?

11 (If applicable) How useful were the onion model and cultural dimensions of Hofstede for your project?

12 Final question: if you had to do the project again (or you had to give advise to other students) how would you approach this project? (3 do's and 3 don'ts)

Appendix 6 – JMP-BoP cases questionnaire

Facts

Your names (+ gender: F/M)
Nationality (raised)
Project name
Your client
Intended users' nation
Duration of stay in intended users' nation
Moment abroad in the whole process
Final design
Picture(s) (please attach to file)

1 Understanding your intended users

1.1 Who are your primary intended users?

1.2 What sources did you use to understand your intended users? Please, mention the most important sources (e.g. website address, title/writer of book/paper, experts…).
And if you could only choose 3 sources, which ones would you prefer? Please tag in the right column.

Source	Specific source	Why?	Top 3
Book(s)			
Scientific paper(s)			
Website(s)			
Manual(s)			
Experts in NL			
Local experts			
Intended users			

Please, add rows if needed

1.3 Which design research methods did you use to understand your intended users and the context they are living in? And which one do you consider as most valuable?

Methods	Specific activities	Tag (x)	Specific goal	Successful?	Reflection (interesting insights?)	Points of attention and tips
Warming up exercises						
PRA techniques (analytic)						
Contextmapping techniques (generative)	sensitizing booklet					
	card set session					
	game					
	photo elicitation					
	video elicitation					
Observations						
(semi-structured) Interviews						
Questionnaires						

Please, add rows if needed

1.4 What **assumptions** about your intended users appeared to be false? (bias)

Please, add rows if needed

1.5 What were important **barriers** in your project related to the understanding of the local context? How did you overcome those barriers: **solutions**? What would you do different in a next similar situation/project?

Barriers?	Explanation	Solutions?	Next approach in new situation to avoid this barrier?

Please, add rows if needed

2 The final design

Which **form**, **properties** and **functions** of your final design are specific for the local culture?
To what kind of **needs** and **values** do they refer?

Form, properties and functions	Needs and values

Please, add rows if needed

Appendix 7 – Card set questionnaire

Design and Culture

Dear design student, you are of great help for educators and fellow design students if you answer the questions below. The results will be used to improve courses and contribute to our research.

*Required

1. **1a. How IMPORTANT is/was each of the following aspects for your project?** *
   Mark only one oval per row.

	very unimportant	--	-	neutral	+	++	very important
physical ergonomics	◯	◯	◯	◯	◯	◯	◯
cognitive ergonomics	◯	◯	◯	◯	◯	◯	◯
cultural meaning & values	◯	◯	◯	◯	◯	◯	◯
technological aspects	◯	◯	◯	◯	◯	◯	◯
business aspects	◯	◯	◯	◯	◯	◯	◯
other	◯	◯	◯	◯	◯	◯	◯

2. **1b. How USEFUL was it for your project to understand the cultural context of your intended users?** *
   Mark only one oval per row.

	not useful at all	not useful	little bit not useful	neutral	little bit useful	useful	very useful
It was	◯	◯	◯	◯	◯	◯	◯

3. **2a. How DIFFERENT is your own culture from the culture of your intended users** *
   Mark only one oval per row.

	it differs not at all	it does not differ	it almost does not differ	neutral	it differs a little bit	it differs much	it differs very much
	◯	◯	◯	◯	◯	◯	◯

4. **2b. How FAMILIAR were you (when you started your project) with the culture of your intended users?** *

Mark only one oval per row.

	not familiar with it at all	unfamiliar with it	little unfamiliar with it	neutral	little familiar with it	familiar with it	very familiar with it
I was	◯	◯	◯	◯	◯	◯	◯

5. **2c. How EASY or DIFFICULT was it to** *

Mark only one oval per row.

	very difficult	difficult	not easy	neutral	not difficult	easy	very easy
generate culture specific questions for your cultural study	◯	◯	◯	◯	◯	◯	◯
to prepare a cultural study	◯	◯	◯	◯	◯	◯	◯
to do/execute a cultural study	◯	◯	◯	◯	◯	◯	◯

6. **3a. What SOURCES did you use for your cultural study? Select your top 5** *

Tick all that apply.

- ☐ books
- ☐ internet
- ☐ experts
- ☐ fellow students
- ☐ lectures
- ☐ cultural card set
- ☐ intended users
- ☐ own experiences
- ☐ other

7. **3b. What design research METHODS did you use for your cultural study? Select your top 5?** *

Tick all that apply.

- [ ] observations
- [ ] literature study
- [ ] exert interviews
- [ ] card sessions
- [ ] preference booklets sessions
- [ ] questionnaires
- [ ] role-playing
- [ ] photo/video elicitation
- [ ] onion model sessions
- [ ] focus group sessions
- [ ] historical timeline
- [ ] other

8. **3c. Which cultural MODELS and THEORY did you use?**

And (only if you used it) how useful was it?
Mark only one oval per row.

	not useful at all	not useful	little bit not useful	neutral	little bit useful	useful	very useful
Circuit of Culture	◯	◯	◯	◯	◯	◯	◯
Socio-cultural dimensions (for ccc card set users only)	◯	◯	◯	◯	◯	◯	◯
Hofstede's dimensions	◯	◯	◯	◯	◯	◯	◯
Hofstede's onion model	◯	◯	◯	◯	◯	◯	◯
Edward Hall's time theory	◯	◯	◯	◯	◯	◯	◯
other models and theory	◯	◯	◯	◯	◯	◯	◯

9. **3d. What other SOURCES, MODELS & THEORY and METHODS did you use?**

The ones that were not mentioned in the list.

.....

10. **4. How do you VALUE your cultural study/contextual research?** *

Mark only one oval per row.

	not at all	not	almost not	neutral	little bit	much	very much
Relevant	◯	◯	◯	◯	◯	◯	◯
Useful	◯	◯	◯	◯	◯	◯	◯
Complex	◯	◯	◯	◯	◯	◯	◯
Inspirational	◯	◯	◯	◯	◯	◯	◯

11. **5. What culture related insights were surprising for you?** *
Something that you did not expect. It could be an anecdote.

.....

12. **6a. The cultural study helped me to..** *
Mark only one oval per row.

	I do not agree at all	--	-	neutral	+	++	I agree totally
develop my design vision	◯	◯	◯	◯	◯	◯	◯
develop concepts	◯	◯	◯	◯	◯	◯	◯
connect with intended users	◯	◯	◯	◯	◯	◯	◯
feel confident not overlooking something	◯	◯	◯	◯	◯	◯	◯
evaluate concepts	◯	◯	◯	◯	◯	◯	◯
convince stakeholders of the quality of my design	◯	◯	◯	◯	◯	◯	◯
other	◯	◯	◯	◯	◯	◯	◯

13. **6b. The cultural study helped me...(other comments?)**

.....

For CARD SET users

Crossing Cultural Chasms Card set

14. **1. How did you use the card set?**
please, specify the situation(s) (including where, when and with whom)

.....

15. **2. For what PURPOSE did you use the card set?**
Mark only one oval per row.

	not at all	not	almost not	little	regularly	a lot
to generate questions						
to set up a cultural study						
to develop my design vision						
to develop concepts						
to connect with intended users						
to feel confident not overlooking something						
to evaluate concepts						
to convince stakeholders						
other						

16. **3. How do you VALUE the card set?** *
Mark only one oval per row.

	not helpful at all	not helpful	quasi helpful	neutral	little helpful	helpful	very helpful
to generate questions							
to set up a cultural study							
to develop a design vision							
to develop concepts							
to connect with intended users							
to feel confident not overlooking something							
to evaluate concepts							
to convince stakeholders							
other							

17. **4. There are 3 times 16 cards = 48 cards. How many do you think you used?** *
Mark only one oval.

- 0%
- 10%
- 30%
- 50%
- 70%
- 100%
- Option 7

18. **5. What, if anything, did you like about the card set?**

19. **6. If you used the socio-cultural dimensions? How did you use them?**
please, include the situation (when and where and with whom)

.....

20. **7a. What did you like most about the card set?** *

.....

21. **7b. What did you like least of the card set?** *

.....

Finally Some Facts

22. **1a. What is the TOPIC of your project?** *

.....

23. **1b. What is the NAME of your team?** *

.....

24. **2a. What is your cultural background?** *
your national background and educational background (bachelor)

.....

25. **2b. Which master are you following?** *
Mark only one oval per row.

	IPD	DfI	SPD
master	◯	◯	◯

26. **2c. Did you follow the course C&C?** *
Mark only one oval per row.

	yes	no
C&C	◯	◯

27. **2d. Which semester are you following (and finishing) right now?** *
This is not the academic semester, but the semester according to your own planning
Mark only one oval per row.

	1	2	3
semester	◯	◯	◯

List of publications

2014
van Boeijen, A.G.C. (2014). Cultural study in design: in search of a meaningful approach. *Proceedings of Engineering and Product Design Education Conference*, 4-5 September 2014, Enschede, The Netherlands.

Ibragimova, E., van Boeijen, A.G.C. (2014). From BoP to ToP and Vice Versa: Daily Practices in Settings with Limited Resources to Inspire Designers. *Proceedings of Design Research Society 2014 Conference*, 16-19 June 2014, Umeå, Sweden.

2013
Rek, M.B., Romero, N.A., van Boeijen, A.G.C. (2013). Motivation to Self-report: Capturing User Experiences in Field Studies. *Proceedings of Latin American Conference on Human Computer Interaction (CLIHC) Conference*, 2-6 December 2013, Guanacaste, Costa Rica.

van Boeijen, A.G.C., Daalhuizen, J.J., Zijlstra, J.J., van der Schoor, R.S.A. (2013) (Eds.). *Delft Design Guide.* Amsterdam: BIS Publishers.

van Boeijen, A.G.C. (2013). Socio-cultural dimensions to sharpen designer's cultural eyeglasses. *Proceedings of Engineering and Product Design Education Conference*, 5-6 September 2013, Dublin, Ireland.

2012
van Boeijen, A.G.C., Stappers, P.J. (2012). Designers coping with culture in an educational setting. *Proceedings of Design Research Society 2012 Conference*, 1-5 July 2012, Bangkok, Thailand.

Kwon, O., van Boeijen, A.G.C. (2012). Co-designing an SMS service for London's homeless people: Considerations for designers engaging with a vulnerable user group. *Proceedings of ServDes 2012 Conference*, 8-10 February 2012, Helsinki, Finland.

Pries, J.F.F., van Boeijen A.G.C., van der Lugt, R. (2012). Deep inside friendly territory: Involving remote co-researchers to understand global users. *Proceedings of ServDes 2012 Conference*, 8-10 February 2012, Helsinki, Finland.

2011
van Boeijen, A.G.C., Stappers, P.J. (2011a). Preparing Western designers for the use of Contextmapping techniques in non-Western situations. *Proceedings of Engineering and Product Design Education Conference*, 8-9 September 2011, London, Great Britain.

van Boeijen, A.G.C., Stappers, P.J. (2011b). Serving the under-served: What can designers learn from Rural Appraisal Techniques? *Proceedings of the International Association of Societies of Design Research Conference*, 31 October 2011 – 04 November 2011, Delft, The Netherlands.

Thieme, J.C., van Boeijen, A.G.C. (2011). Some students are more different than others. *Journal of Design Research*, (9)2, 119-130.

2010

van Boeijen, A.G.C., Daalhuizen, J. (2010) (Eds.). *Delft Design Guide: theory, methods and competence in design.* Delft: Faculty of Industrial Design Engineering, Delft University of Technology.

Siemerink, P., Rek, M., van Boeijen, A.G.C., Lee, YK., Lee, KP. (2010). Digital User Research in Korea. Defining Quality Factors for an internet-based research tool. *Proceedings of Designing Interactive Systems 2010 Conference*, August 16-20, Aarhus, Denmark.

2009

van Boeijen A.G.C., Parmar, V. (2009). Educated naïve in rural areas of the BoP domain. *Proceedings of the Symposium 'Designing for, with, and from user experiences'*, Delft: Faculty of Industrial Design Engineering, Delft University of Technology.

Arik, D., van Boeijen A.G.C., Kandachar, P.V. (2009). Persuasion for a Healthier Life: Persuasive Technology Design Guidelines from the Precious Project for Indian Diabetics. *Proceedings of International Association of Societies of Design Research Conference*, Seoul, South Korea.

Akil, M., van Boeijen A.G.C., Boess, S. (2009). Sharing migrant stories: inclusion through facilitation of storytelling. *Proceedings of Include conference*, London, Great Britain.

2008

Thieme, J.C., van Boeijen A.G.C. (2008). Some students are more different than others. *Proceedings of Engineering and Product Design Education Conference*, 4-5 September 2008, Barcelona, Spain.

van Boeijen, A.G.C., Stappers P.J. (2008). How can designers better incorporate cultural aspects in their designs for the Base of the Pyramid (BoP) … and why should they? *Proceedings of DesignEd Asia Conference 2008 Conference*, Hong Kong, China.

2007
van Boeijen, A.G.C., Badke-Schaub, P. (2007). Designing products in multi-cultural teams in the context of education. *Proceedings of Engineering and Product Design Education Conference*. Newcastle Upon Tyne, Great Britain.

van Boeijen, A.G.C. (2007b). A manual as a catalyst. In M.C.A. v. d. Sanden, P. Baeten, C.J.C.C. Broeksmit, E.A.M. Esveld, L.E. de Vlieger (Eds.), *You can't just blame the crocodile* (pp. 112-119). Delft: Delft University of Technology.

van Boeijen, A.G.C. (2007a). Hoe worden gehandicapte kinderen in Ethiopië zelfredzaam? *O2 Magazine*, 15, (pp. 24-27).

2004
van der Lugt, R., Kuipers, K., Roozenburg, N.F.M., van Boeijen, A.G.C., van de Geer, S., Kornmann, K., Nauta, K., Prins, J. (2004). The changing face of design project education in the Delft Industrial Design Engineering curriculum. *Proceedings of Engineering and Product Design Education Conference*, 2-3 September 2004, Delft, the Netherlands.

1996
van Boeijen, A.G.C., Flier, P., Oldenkamp, I., Toetenel, O., Vermeulen, R., Verweij, J. (1996). *Tricycle Production Manual.* Delft: Delft University of Technology – Centre for International Cooperation and Appropriate Technology.

van Boeijen, A.G.C. (1996). Development of Tricycle Production (DTP) in developing countries. *Proceedings of RESNA '96 Annual Conference: Exploring new horizons … pioneering the 21st century* (pp.402-403). Salt Lake City, United States of America. – cited by Oosterlaken, 2009, p. 99.

1990
van Boeijen, A.G.C. (1990). *Vezelversterkte kunststof racerolstoel*. Master thesis, Delft University of Technology, Delft.

Curriculum Vitae

The first thirteen years of my life were spent in Tholen, a small town on an island in the Dutch province of Zeeland (1965-1978). My family then moved to Harderwijk, where I completed high school. It is also where I first became interested in the notion of product design. My inspiration was the beautiful bracelet-watch that my dear friend Margo wore, the design for which had been created in 1973 by Bruno Ninaber van Eyben.

My parents' influence in terms of social responsibility and commitment was probably also reflected in my subsequent focus on goals involving social design.

In 1983, I began my studies in the faculty of Industrial Design Engineering (IDE) at the University of Technology in Delft (DUT), and finished them in 1990, after gaining a Master of Science degree and the title 'industrial design engineer'. The final project for the successful completion of this degree was the design of a carbon-fibre racing wheelchair for the Dutch organisation Veldink, which manufactures a wide range of wheelchairs. The product was presented at the Paralympics 1990 in Assen, the Netherlands, and was displayed in two exhibitions: 'Young Industrial Designers' in the Stedelijk Museum Amsterdam (1990) and 'Made in Holland' in the Kunsthal Rotterdam (2009). In the meantime, Veldink has produced twenty of these racing wheelchairs.

Following my graduation, I became involved in various design projects, as a designer, project leader, and consultant.

In 1990, I worked on the design of a suitcase at the DUT in the faculty of Aerospace and Engineering. The aim of this project was to demonstrate application possibilities regarding prefabricated and moulded composite sheets. The design included production mould development, prototyping, and testing.

From 1992 to 1995, I was employed by the Centre of International Cooperation and Appropriate Technology (CICAT) and by IDE. In this capacity, for and with universities and companies in developing countries (e.g. India, Sri Lanka, Thailand, and Vietnam), I was engaged in international design projects relating specifically to the development and production of hand-operated tricycles. The aim was to assist tricycle producers in improving their design and production methods, as well as to disseminate information and share knowledge in order to support handicapped people in impoverished environments. One of the results was the publication of a Tricycle Production Manual, which has been distributed worldwide. At the same time, and commissioned by CICAT, I coordinated international internships for Dutch students.

From 1995 to 1997, I worked for IDE and CICAT on the setting up and implementation of an eco-design programme for companies and universities in developing countries (among others, universities and companies in Costa Rica, The Philippines, China, and Tanzania). The programme included eco-design workshops, master graduate projects, and other educational activities.

From 1997 to 1999, I was active as a product innovation consultant for Syntens, an initiative of the Dutch Ministry of Economic Affairs, established to support small- and medium-sized enterprises (SME). In addition, I carried out a needs analysis for CICAT regarding development of the design curriculum at the University of Dar es Salaam in Tanzania.

During my consultancy period, however, as much as I enjoyed the interaction and the satisfying results, I found that I was beginning to miss the creativity and inspiration associated with an academic environment; hence, I decided to return to the university.

Since 2000, I have worked full time for IDE, first in the role of educator and course coordinator, and later also as a researcher. In 2002, I initiated and organised the design exhibition *Productmagic 2002: the magic of everyday things*. In 2006, I worked in a project team on the redesign of the IDE bachelor curriculum, followed by the development and coordination of the bachelor design course Concept Design, which is geared to accommodate 500 students and 42 design tutors. The student association presented it with an award for being the best bachelor course of 2009.

From 2006 to 2008, I was a board member of O2 Nederland, the Association for Sustainability and Design.

Gradually, however, my interest began to turn from practice-based projects – integrating technology, human factors, and business – to theory-based projects with a focus on human-centred design.

Currently, my research is focused on the role of culture in design processes, with the goal of increasing information and expanding knowledge, and of designing methods and tools geared to support designers in cultivating a culture-conscious approach. This motivation is in line with my initiative to develop the Delft Design Guide, an overview of design models, perspectives, and methods for students, tutors, and practitioners. Launched in September 2013, the design guide has already been translated into Chinese and Japanese, and has been applied in a Massive Open Online Course (MOOC).

As regards the near future, I am eager to continue researching the role of culture in design processes, and translating insights into the means that support and inspire novice design students and design teachers, as well as design practitioners, to create product concepts that mean something to people everywhere.

Acknowledgements

Doctoral research is, in a way, a highly individualistic endeavour. Nevertheless, while working on this thesis, I was aware of being simply a part of a comprehensive whole. What we as individuals create is to a considerable extent dependent on human relationships. And because it is important to cherish these relationships, it is my pleasure to acknowledge here all of those that facilitated my research.

I was able to complete this thesis only because so many people contributed to it. Of course, I am responsible for the process and the content, but – just as in a design project – the result was achieved through collaboration, a method that apparently suits me. I remember that as long ago as 1990, my thesis professor, J. W. Drukker, commented that I was a team player.

I was able to complete this work with the support of all of you who sensed my desire to investigate experiences gained from my own practice in the field of design. In a sense, the thesis was co-authored by those who believed in my abilities, and who encouraged me to write down my thoughts and observations, as well as by designers and design instructors who were eager to apply my findings. Ultimately, the work derives its significance by way of *peopl*e, and these people are *you*.

Cees de Bont, Daan van Eijk, Prabhu Kandachar, Jan Jacobs, and Paul Hekkert, thank you for offering me the opportunity to do research. In your roles as, respectively, dean, department head, coordinator of the 'Base of the Pyramid Healthcare Research' programme, and heads of the section Design Aesthetics, you invited and motivated me to undertake this study.
Thank you as well, Petra Badke-Schaub, for encouraging me to do a PhD, and for helping me with one of my first papers.

Pieter Jan Stappers, thank you so much for your unceasing enthusiasm. You taught me to determine my core interests and to express my thoughts in words and images. Your extensive positive advice always inspired me to continue.
Thank you, Frido Smulders, for boarding my research train, even when it was already moving at full speed. Your coaching talent and eye for the big picture and details helped me to structure and fine-tune the numerous data.
Promotion committee members Prabhu Kandachar, Dirk Snelders, Anita Hardonk, Peter Lloyd, and Jane Fulton Suri, and chair Ena Voûte, thank you for your interest and effort in reading my thesis, in providing feedback, and in travelling to Delft.

Design students, clients, colleagues, there are so many of you that I cannot thank you individually by name, and I would be afraid of forgetting to mention you. My dear students, I referred to many of you via the projects selected for the

card set and for this thesis. I am deeply grateful for having had the opportunity to join your projects, to share my thoughts with you, and to benefit from your learning experiences. Fortunately, I am continuing to acquire knowledge. Every year, new students embark on bold and challenging projects that are increasingly internationally oriented and socially engaged. These projects, and you, the students, play a pivotal role in aiming to effect positive changes in many of the world's social, economic, and political situations.
Clients, and other initiators of design projects, thank you for your cooperation. Your projects are of considerable value to our students, to my colleagues, and to me.
Colleagues, thank you for everything that we love to share and to learn together in this rich and compelling field of study, Industrial Design Engineering. Timo de Rijk, thanks for the lively discussions regarding our joint course 'Design, Culture and Society' and your eponymous professorship.

Donna Devine and Wim Schoorlemmer, by way of, respectively, your English language editing and graphic design, you crossed the last 't' and dotted the last 'i' of my thesis, so to speak. Thank you so much for your dedication, interest, and eye for details. It was a pleasure to work with each of you.
Lisette Janssen, Roos Durieux, Mark van Huystee, and Joel Kuntonen, thank you for your visual and textual contribution to the cards; Irene Kamp, thank you for the application; and Brigit Varenkamp, thank you for creating the website.
Juul Leeuwis and Oscar Van Hemel, thank you for your support as paranymphs, and for our longstanding friendship.

My friends and family, you are the indispensible reflection of my existence. The values and practices that I share with you remain dear to my heart, and their foundation rests firmly with my parents, Jacob Elbert and Geertje Anna van Boeijen-Katsburg, and with my sister Jacobien and my brother Henk.

Thomas Mattousch, while my thoughts are often lodged in the past and in the future, you continually provide the tranquillity and the opportunities for relaxation that are essential in the here and now. This is a priceless gift.
'If you live to be a hundred, I want to live to be a hundred minus one day, so I never have to live without you' – A.A. Milne, from Winnie-the-Pooh.

Colophon

Thesis
graphic design: Wim Schoorlemmer
graphic design (icons): Lisette Janssen
text editing: Donna Devine
print: Drukkerij PP-offset

Card set
www.designandculture.info
graphic design (Concept 2): Lisette Janssen
graphic design (assistant Final Design): Roos Durieux
text editing: Joel Kuntonen
print: Druk. Tan Heck

ISBN 978-90-9028805-5


TU Delft