



Cross-Cultural Recycling and Design Methodology; to Prove the Effectiveness of the Three-Stage Design Method of Cross-Cultural Recycling “Why-What-How”

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Abstract. From a traditional standpoint, recycling has commonly been summarized within the so-called 4Rs: Reduce, Reuse, Recycle and Refuse, however, today’s multi-disciplinary and multi-cultural society encourage us to seek solutions beyond the traditional 4-Rs. This paper starts from the belief that recycling is cultural activity which can fuse various intangible - social, theoretical and cultural aspects of people’s lives such as lifestyle, art, culture and ethics, a condition which we refer to as “Cross-Cultural Recycling”. Therefore, this paper aims; (1) to academically prove that recycling is a cultural activity, (2) to determine whether the consideration of cultural dimensions in the design process of recycling results in more contextualised design, and finally, (3) to establish how to define the design factors related to Cross-Cultural Recycling, which we call “Cross-Cultural Recycling Design methodology” through practical design projects from 4 recycling design workshops between 2017 and 2018 at the Hanyang University Interior Design graduate course where we applied Cross-Cultural Design Methodology in accordance with the context of recycling design. As a result of the theoretical investigation and findings from 4 design workshops, this paper proposes a three-stage Cross-Cultural Recycling Design Method; Why-What-How. The first stage, “why” deals with the three main factors considered with regards to the motivation for recycling, the environmental, economic and cultural considerations and implications. The second stage, “what” is about to define “waste” to be recycled and offers 4 key concepts; forgotten, wasted, abandoned and misplaced. The third stage, “how” provides 6 keywords, and their concepts, which are pivotal in the future direction of this design approach; use, craft, technological, design, art and culture.

Keywords: Recycling · Cross-culture · Design education · Design methodology

1 Introduction

The matter of environmental degradation is undoubtedly one of the most critical global problems in the 21st century with “recycling” being one of the key issues that has been constantly discussed in line with this issue. As such, nowadays there is vast array of

waste management and recycling techniques available in the market. From a traditional standpoint, recycling has commonly been summarized within the so-called 4Rs: Reduce, Reuse, Recycle and Refuse. The first 3 Rs are definite factors, and the last R – Refuse varies depending on the focusing values, for example, some say recovery, depending on the context. Recently, at the Grand Master Class 2019, one of the biggest annual forums in Korea which was held in Seoul from the 26th to the 27th of January under the title “Future for us”, Prof. Jae Chun, Choe, who is currently the professor at the Faculty of Biological Science, Ewha Womans University, Korea¹ made a speech on the first day about how we should approach environmental issues in order to secure a “future for us”. In the speech, Prof. Choe proposed a new paradigm for recycling as an improvement to the traditional 4-R concept of recycling (Reduce, Reuse, Recycle, Refuse). Here, he suggested 2 new keywords – Reflect and Restore, which he noted emphasised the importance of people’s attitude and participation (Fig. 1).



Fig. 1. Prof. Jae Chun Choe at the Forum <Grand Master Class 2019 “Future for us”>

Environmental problems are global issues which are not impossible to solve if governments take a very definite stance and implement measures to deal with them. For example, the Chinese government banned the presence of factories within the metropolitan region of Beijing as well as strictly limiting the numbers of cars found in Beijing city centre for a few months before the Beijing Olympics in order to improve the air quality during the Olympic period. However, not a lot of governments are able to take such a drastic and decisive measure because of the different complexities of each country’s economic, social and cultural factors. As such, heavy governmental intervention and control within this field is not the best solution. Therefore, many scholars and activists including Prof. Choe repeatedly emphasise the need for awareness about the seriousness of the environmental problems. Here, a pro-attitude, active and constant participation at the individual level becomes critical. Prof. Choe made it clear that “there is a certain limit to what the government alone can solve when it comes to tackling the environmental problems. Thus, each one of us should change” (NEWS

¹ Prof. Choe is also the President of the Ecological Society of Korea, Alternate President of Convention on Biological Diversity (CBD), and the Founding Director of National Institute of Ecology.

2018). Whilst most of the responsibility of waste is born to consumers and society (Jones 2010), comprehensive solutions won't be found unless each one of us, who are actually stakeholders of all activities happening in our society, change. The technological development and design, and commercialising of those requires finance and time, and its application is still limited, but changing people's awareness and attitude, which continues to an increased people's action can have better – more effective impact. According to Gay Hawkins, recycling possesses emotional value; he argues that people at its simplest level, recycling can make them feel “good” which he calls as “ethical self-improvement” (Hawkins 2006). In the similar note, Kendall and Koster also argues that people “launder our collective consciousness” when we recycle bottles and paper etc. (Kendall and Koster 2007).

Therefore, it is critical to understand not only environmental issues but also recycling activity from a social and cultural perspective. In this standpoint, the role of design and designers becomes crucial. If viewed from a socio-cultural perspective, where environmental and recycling problems result from a lack of “consciousness” and positive “attitude” to solving the issue, design is not a technical factor for actual production; rather, it can play a more valuable role in improving people's awareness and encouraging people's motivation. Design is not only a problem-solving process, but also an expression of intention.

This paper starts from the belief that recycling is cultural activity which can fuse various intangible - social, theoretical and cultural aspects of people's lives such as lifestyle, art, culture and ethics, a condition which we refer to as “Cross-Cultural Recycling.”

This paper aims; (1) to academically prove that recycling is a cultural activity, (2) to determine whether the consideration of cultural dimensions in the design process of recycling results in more contextualised design, and finally, (3) to establish how to define the design factors related to Cross-Cultural Recycling, which we call “Cross-Cultural Recycling Design methodology” through practical design projects.

2 Recycling as a Cultural Activity

For the past few decades, the word “recycling” has been mainly associated with recycling our waste, excess and re-usable goods mainly for environmental reasons. (Kendall and Koster 2007) A lot of dictionary definitions of the word “recycling” associate it with “recycling waste”; for example, the Cambridge Dictionary defines “recycling” as [the process of collecting and changing old paper, glass, plastic, etc. so that it can be used again]. Similarly, the Oxford Dictionary defines it as [The action or process of converting waste into reusable material]. However, recycling as a pure activity should not be necessarily associated with only waste; recycling as an activity has been practiced throughout human history for economic, artistic and technological reasons, not only for saving environment.

In the art realm, many artists and craftsmen also often use existing objects, which are not necessarily waste and are commonly referred to as ‘found-objects’ or ‘ready-made’ (terms used in the contemporary pop art), as their material for their art works. Responding to the demands of today, especially considering an action's impact on the

environmental crisis we are currently facing, the concept of “recycling” has somewhat evolved into a “green” movement, but the essence of “recycling” as an activity is rather on the action itself of “changing” or “converting”, which requires a more contextualised understanding of surroundings.

Although there are not many who gives an insight into the word “recycling” from a non-environmental dimension, particularly when it comes its relationship with cultural boundaries. Tina S. Kendall and Kristin Koster from the University of California are one of the very few who tackle this topic. Kendall and Koster launched a journal called “Cultural Recycling” on their e-journal “Other Voices” back in 2007. In their discussion into the issue of “Cultural Recycling”, Kendall and Koster give an apt and probably the only insight into the cultural dimensions of recycling. According to the duo, the term “recycling” has now made “a conspicuous appearance within academic discourse, emerging as a paradigm for understanding the way that artistic, literary, or cultural environments function” and “the rhetoric of recycling spills over into other levels of social discourse, from the aesthetic and historical to the legal and technological.” (Kendall and Koster 2007). Kendall and Koster advance the concept of recycling into areas of social and cultural reproduction, where recycling becomes more ideological with “conflicting values of continuity and change”. In this conceptual understanding of “recycling”, defining recycling will always be complicated and the definition may need changing; as such it is crucial to place emphasises on the importance of understanding “recycling” contextually. The contextual understanding of recycling might seem difficult however it is simply about relating oneself to the socio-cultural surroundings of his/her location to the recycling activity, which means that every recycling case should be built on its own context. In the same vein, Jacques Derrida has noted that a “de-constructive understanding of history can be achieved through the critic’s efforts of going back to the expelled, rejected and repressed elements of historical memory and recycling these histories, genres and voices” (Kendall and Koster 2007). Recycling in its very essence involves some type of conversion or fusion, which creates new value out of different objects; recycling in the traditional understanding is more about hardware improvement, but today, recycling refers to a more software approach, in other term, it denotes cultural dimensions which can fuse different parts from various objects, which is where we derived the term “Cross-Cultural Recycling”. Overall, it is true that recycling is both a cultural and creative activity, and thus an interdisciplinary approach towards recycling is required and becomes urgent.

As we now realize that recycling is not just about dealing with abandoned waste, it becomes crucial to come up with guidelines on how to “recycle” culturally, and this is where the role of “design” plays a pivotal part. William McDonough and Michael Braungart’s latest book <Upcycling> is noteworthy in discussing the matter of design within the context of recycling. Through this book, McDonough and Braungart encourage us to seek solutions beyond the traditional 4-Rs (Reduce, Reuse, Recycle, Refuse), since they view them as limiting creativity. William McDonough and Michael Braungart propose “an ideal scenario in the quest to solve the ecological crisis we are currently facing” by asserting that “resource scarcity and sustainability is a matter that has more to do with design.” As McDonough and Braungart argued, today’s environmental problems can be solved via design improvement and so a more careful approach to design details is critical; however, it is not easy to change all products and

more ultimately human activity into a form that is optimised for recycling. (McDonough and Braungart 2013) Therefore, the role of design is to broaden the approach to recycling by understanding people and their different contexts when it comes to environmental issues; the meaning of waste can vary from person to person and from region to region. In this sense, we tried to establish a Pro-attitude by attaching the Cross- concept to existing Cultural Recycling. To us, Cross- is an intention and an active attitude.

Since the concept of “Cross-Cultural Recycling” is newly defined by us, definition is as follows;

1. Recycling is an “awareness of the problems” associated with our socio-cultural background and taking necessary step to improve consciousness of different local contexts when dealing with waste.

>> Why

2. Recycling is a complex process and its definition is constantly changing, so it is necessary to actively understand this problem according to the circumstances of each individual. Therefore, defining recycling will always be complicated and the definition may need changing.

>> What

3. Recycling has many complex facets so it is vital that, when addressing the issue, people focus on both the cultural and artistic aspects of our lifestyles in order to develop aesthetic ideas and artistic approaches.

>> How

This is our definition of the term “Cross-Cultural Recycling Design” as well as the explanation of our 3 step “Cross-Cultural Recycling Design method”; Why-What-How.

3 Methodology

Since last 2010, we have been conducting actual design workshop at Goldsmiths University in the UK where we focused on examining Cross-Cultural Design processes and Practical Methodologies. Cross-Cultural Design is a methodology that understands the socio-cultural context in the design process and concentrates on the process of why, what and how to design it. Our methodology is based on Dong Young Lee’s Cross-Cultural Design Methodology (Lee 2016). We tried to finance this cross-cultural design methodology by introducing it for the purposes of understanding the cultural dimension of recycling design.

Following the theoretical introduction of the subject, in order to establish the practicality of the Cross-Cultural Recycling Design Methodology, we conducted 4 recycling design workshops between 2017 and 2018 during the graduate design course of the Hanyang University Interior Design course. We constructed the Cross-Cultural Design Methodology in accordance with the context of recycling design (Table 1).

In this process, we set up a three-step design method called Why-What-How based on the concept of extensibility of recycling as a cultural entity discussed above in Sect. 2. During each term, we conducted design workshops with about 7–12 graduate design students to design 3 dimensional objects, which had both practical and artistic

Table 1. Summary of 4 recycling design workshops

Workshop 1	Workshop 2	Workshop 3	Workshop 4
Individual projects		Team projects	
1 st Term, 2017	2 nd Term, 2017	1 st Term, 2018	2 nd Term, 2018
8 students, 7 teams	6 students, 5 teams	6 students, 3 teams	6 students, 3 teams

qualities, within the recycling design boundary. The workshop intended to invite the participating students to adopt the 3 stage design process of “Why-What-How” when designing their own projects that involved coming with their own definition of what waste is. Each term lasted for 4 months and the weekly design workshop was for 4 h each time. Participating students worked individually for the Workshop 1 and 2 and then in groups of 2-3 for the Workshop 3 and 4 in order to improve the quality of design and production. Each term had 3 main sessions – 1, how to define waste and understand recycling, 2, practically selecting what to recycle, 3, the actual prototyping.

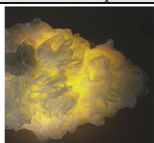

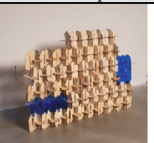

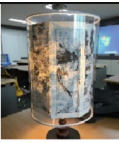






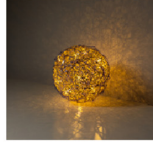


Through the actual design outcomes from the design workshops, the concrete language of Why-What- How was established as presented in the chapter of Findings.





4 Findings

From 4 Cross-Cultural Recycling Design Workshops, we produced 21 projects. Table 2 is a summary of the projects. Each project is explained with the following information; (1) Type of object, (2) Why: Motivation, (3) What 1: Chosen Material, (4) What 2: Definition of Waste and (5) How: Design Method.

One interesting finding is that working individually or in a team affected the motivation of the project. The projects from the workshop 1 and 2 where participating students worked individually showed more personalised choice of material to recycle, for example, old go board (Project 1-4), comic books (Project 1-2) or Xylophone (Project 1-7), and Old Duvet set (Project 2-2) which the students defined “wasted” as “forgotten”. These old objects are not necessarily something they want to throw out, but rather keep and remember. Project 2-2 transforms old duvet set into a stool, interestingly trying to symbolically show the fusion of sitting culture of the East and standing culture of the West through this recycling design. Some international students tried to reflect their unique lifestyle of being abroad and living in a temporary accommodation, for example, Project 1-3 started from the scene the student often sees in her neighbourhood with many foreign residents using mattress only and dumping it out on the street when moving out. This student retranslated “waste” as “misplaced”. On the contrary, the projects from the workshop 3 and 4 where the students work in a group showed more socially and culturally directed motivation, for example, Project 3-3 started the project from the increasing volume of paper waste with an in-depth study of the recent trend of being digital. This team also defined “waste” as “misplaced”. Project 4-2 was specifically directed to how to technically and practically recycle a huge volume of daily plastic consumption from the university campus. The details of each project are documented in Table 2.

Table 2. Summary of projects from 4 Cross-Cultural Recycling Design Workshops

	Workshop 1	Workshop 2	Workshop 3	Workshop 4
Final design				
Project no.	Project 1-1	Project 2-1	Project 3-1	Project 4-1
Type of object Why:Motivation What 1:Material What 2:Definition How:Method	Lighting Reuse Wasted Shower Balls Wasted Hand craft	Vase Reuse, Show- case of New technology Abandoned PET bottles Abandoned, Wasted Laser Cutting	Partition Wall Reuse Abandoned plywood from construction site Abandoned Laser cutting	Vase Reuse/ Showcase of New technology Abandoned PET bottles Abandone/ Wast- ed 3D printing
Final design				
Project no.	Project 1-2	Project 2-2	Project 3-2	Project 4-2
Type of object Why:Motivation What 1:Material What 2:Definition How:Method	Lighting Remember/ Reuse Old comic books Forgotten Handcraft	Stool Remember/ Reuse Old duvet Forgotten Handcraft	Tea table Reuse/ technol- ogical intervention Wooden Plates Wasted 3D Printing	Wall tile units Reuse/Social Message PE,PET plastic caps Wasted/ Aban- doned Mechanical
Final design				
Project no.	Project 1-3	Project 2-3	Project 3-3	Project 4-3
Type of object Why:Motivation What 1:Material What 2:Definition How:Method	Storage Reuse Mattress Springs Wasted/ abandoned handcraft	Tea table Reuse Cloth Hanger Wasted Handcraft	Tea Table Reuse/ Social message Paper magazines, leaflets Wasted/ Aban- doned/ Misplaced Handcraft	Lighting Reuse/ Social Message PET bottles Wasted/ Abandoned Handcraft
Final design				
Project no.	Project 1-4	Project 2-4		
Type of object Why:Motivation	Small table Remember/ Reuse	Lighting Abandoned/		

What 1:Material What 2:Definition How:Method	Old go board Abandoned/ Forgotten Handcraft	Wasted Leftover acrylic pieces Wasted/ Abandoned Handcraft
Final design		
Project no.	Project 1-5	Project 2-5
Type of object Why:Motivation What 1:Material What 2:Definition How:Method	Stool units Reuse Drain pipes Abandoned Handcraft	Lighting Reuse Wooden Chop- sticks Wasted Handcraft
Final design		
Project no.	Project 1-6	
Type of object Why:Motivation What 1:Material What 2:Definition How:Method	Stool units Reuse Drain pipes Abandoned Handcraft	
Final design		
Project no.	Project 1-7	
Type of object Why:Motivation What 1:Material What 2:Definition How:Method	Wall decoration Remember/ Abandoned Xylophone Forgotten/ Mechanical, Hand- craft	

5 Discussion

To summarise, the Cross-Cultural recycling design tools <Why-What-How> are applied to our recycling design workshops in order to empirically test the role and the influence of cultural dimensions within the recycling design.

The fundamentals of the Why-What-How process are the basis of Lee (2016)'s cross-cultural design method mentioned above. The Motive and Action tools are the

core pillars of the Cross-Cultural Design method which focuses on encouraging designers to figure out how develop their own design approach as well as identifying the reasons for it (Fig. 2).



Fig. 2. Cross-Cultural Design <Motive-Action> Tools, 2016 (Lee 2016)

We redefined Lee’s Motive – Action tool of the Cross-cultural design process for recycling design as the why → what → how process. While in the previous Cross-cultural design method we provided designers with the “what” to design totally on their findings from the motive stage, the Cross-cultural recycling design method clearly incorporates the “what” stage in order to encourage designers to re-define their own definition of waste in reflection of the context of where they are located (Table 3).

Table 3. Comparison of Cross-Cultural design method & Cross-Cultural recycling design method

Cross-Cultural Design method	MOTIVE → ACTION
Cross-Cultural recycling design method	WHY → WHAT → HOW

(1) Why

Here, ‘Why’ is another term for Motive, which is what gives people a reason and rational to start a project. It is almost universally accepted that there is a positive correlation between motivation and learning, and design education is not an exception. Dewey (1966), an influential education reformer in the traditional education scene, stated that the most important attitude in education is to plant in students a desire to learn. The more motivated a person is about a given subject, the more likely it is that they will learn about it. Malone (1981) claims that intrinsically motivated students may spend more time and effort learning, feel better about that learning, and use that learning more in the future. The Why method has 2 levels; the first level involves setting an aim, which is the initial reason for recycling whilst considering – (1) environmental, (2) economic and (3) cultural implications. The second level is to identify

an objective, it is more about identifying an actual goal to achieve and it has five factors - (1) Promote, (2) Share, (3) Adopt, (4) Protect and (5) Deny. The second level of Why is adopted the Motive too of Lee’s Cross-cultural design method (Table 4).



Table 4. Keywords of MOTIVE of Cross-Cultural Recycling design method

Motive 1 AIM	Environmental		Economic		Cultural
Motive 2 objective	Promote	Share	Adopt	Protect	Deny

(2) What

Traditionally, identifying what had to be recycled was a very straight forward process especially if we look at examples like disposable plastic cups, straws, used paper, broken furniture and various construction waste. Today, however, there is a wide array of garbage which requires different methods to recycle. As a result of the rapid change of socio-cultural backgrounds of our living environment, the traditional understanding of “waste” no longer works. Today, waste cannot be simply understood as “plastic cups in a rubbish bin”. For example, there has been a lot of controversy about how to deal recently with “E-Waste” (electronic waste) which refers to discarded electrical or electronic devices. E-Waste has dire effects on the environment in many parts of the world and it is the result of rapid development of technology. Furthermore, because today’s global society is frequently crossing geographical borders, there is an increase in the number of prefabricated packed furniture, which overall leads to the discarding of the packaging along with the used furniture as waste. Moreover, these migrations tend to increase the number of households in a invariably increasing the amount of garbage and here it is important to note that this new, increased waste is different from the usual one and so the understanding of its implications on the local contexts have not been established.

As such, the discarding of waste is a very cultural process and it is the basis of Cross-Cultural Recycling design which is a process of having a deeper understanding and insight on our society and lifestyles. In fact, the cultural aspect refers to the process of subjectively exploring, understanding and accepting the contexts of various societies, and this process is also a process of self-learning. Therefore, the idea of cultural recycling should not simply follow an aesthetical, technical or economical approach; it

has to redefine garbage from a new perspective. The normal definition of recycling does not fully address the complexity of the problem since it does not really touch on the consumer's behaviours. The Cross-Cultural Recycling Design method defines 4 categories in the What section that tackle this issue; (1) forgotten, (2) wasted, (3) abandoned and (4) misplaced based on the findings from analysing the projects from design workshops.

(3) How

The term 'How' is also understood from a similar perspective. There are various ways to approach where recycling activity and techniques developed from and the reasons for it. (1) Creating a new use, (2) Creating a new look and purpose from a craft perspective, (3) Technological conversion, (4) Improving the quality of the design manner and (5) Artistic Re-invention. The initial stage of the recycling process has to do with the manner in which the waste is collected. The second stage is about how to reuse the waste which brings about the matter of design. As such, the first stage of recycling refers to the physical re-usage of the waste; giving a new purpose to waste which is recoverable and has no major damage by making the most of the morphological and material characteristics of the existing product. Here, D.I.Y activities can be employed. Converting waste back into raw materials is also one of the most common methods of recycling; for example, collected waste paper and plastic bottles can be converted into raw materials like paper pulp and liquefied plastic respectively. As a result of the many recent technological developments in today's world, there are easier, more effective and specialised ways of recycling materials available in the market. A different aspect of recycling deals with more theoretical aspects of the waste which involves improving the look of the product by integrating concepts and artistic values, along with integrating social intentions. For example, Sonic Fabric designed by the sound and conceptual artist Alyce Santoro weaves cassette tape with polyester thread to create a textile that can play sounds from the tape. 'Sonic Fabric' perhaps is not viable for immediate use as a final product, however it shows the possible future direction of recycling, arouses people's interest in recycling and refreshes people's understanding of the products made from recycled materials. Of course, these methods have not developed chronologically, but the latest issue now is about how to (6) culturally recycle (Figs. 3, 4 and 5).

- 1) *USE: giving a new use*
- 2) *CRAFT: giving a new look and purpose in a craft manner*
- 3) *TECHNOLOGICAL: technologically converting*
- 4) *DESIGN: improving the quality in a design manner*
- 5) *ART: artistically re-inventing*
- 6) *CULTURE: culturally recycle*

Fig. 3. Words of HOW of Cross-Cultural Recycling Design Method

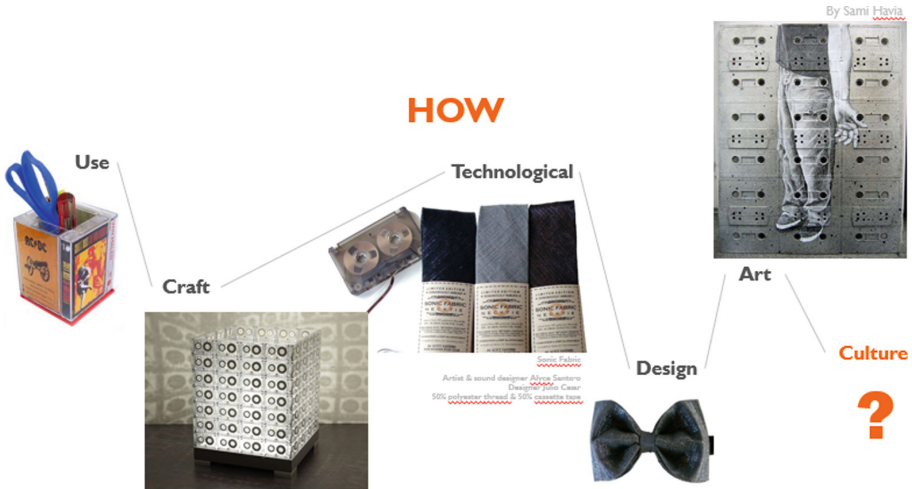


Fig. 4. A map for Cross-Cultural Recycling Design tool <How> – lecture materials

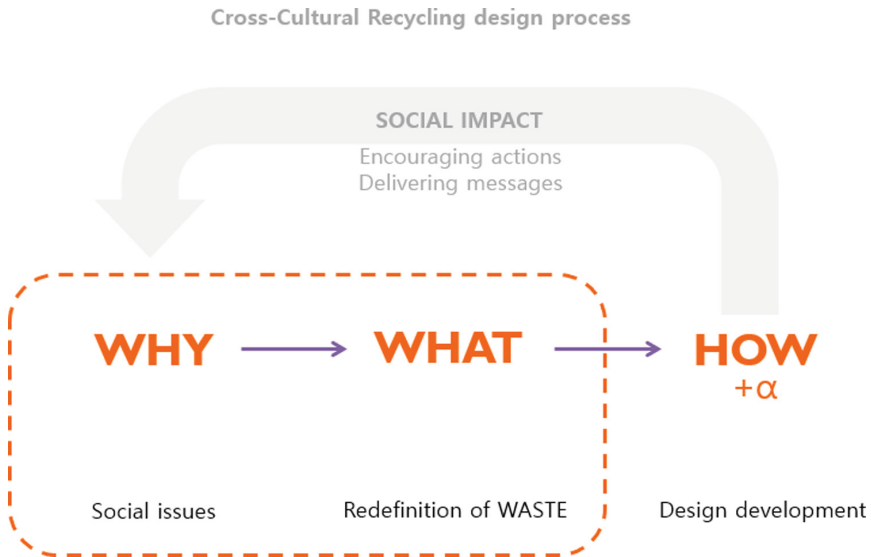


Fig. 5. Cross-Cultural Recycling Design Process

6 Conclusion

As a result of this theoretical investigation and projects from 4 design workshops, this paper proposes a design method which employs a three stage Cross-Cultural Recycling design process; Why-What-How. The first stage, “why,” deals with the three main factors considered with regards to the motivation for recycling, the environmental,

economic and cultural considerations and implications. The second stage “what” offers 4 key concepts; forgotten, wasted, abandoned and misplaced. This stage is all about how to define the “waste” to be recycled whilst paying attention to today’s cultural and social contexts which have been largely influenced by age, industry, lifestyle change and frequent migration, which is one of the core elements of our “Cross-Cultural Recycling” design process. We believe that this stage will refresh people’s understanding of waste and widen the boundary of recycling activity. The third stage, “how” provides 6 keywords, and their concepts, which are pivotal in the future direction of this design approach; use, craft, technological, design, art and culture.

As a result, this paper concluded on two main outcomes. From the feedback of the design projects from the workshops, using the “Cross-Cultural Recycling” design process of Why-What-How helps designers to design more contextualised and culturally viable design. It also helped them find a new way to understand and interpret different cultures and develop new design concepts and directions. The second core outcome is the effectiveness of the proposed cultural recycling design process; Why-What-How.

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