Co-design: An Investigation Through Interviewing Expert in Europe

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Abstract. This paper summarized the study of the co-design expert interviews in Europe. Seven interviews were conducted, recorded, transcribed and then analyzed with the general inductive approach. Twelve categories were divided into the upper level of the principles about co-design and the lower level of the practical experiences and techniques. At last, the authors extracted the most impressive perceptions from the twelve categories based on the Chinese co-design experiences.

Keywords: Co-design · Participatory design · Expert interviews

1 Introduction

During the latter half of the 20th century, design research circle in Europe had undergone a steady transformation in its attitude with the various stakeholders involved in the design process, especially in between users and designers. From the original conception of "designing for people," it evolved to "designing with people" and eventually arrived at this novel conception of "designing by people". In the wake of all these changes, the notion of co-design (or participatory design) emerged as it was carefully studied and constantly mentioned first by the Scandinavians and then throughout the western hemisphere during the fall of last century and well into the century that we are living now. In the process of its growing influence and application, co-design saw the development and introducing of various tools and methods applicable in this design-led research. These include generative tools [1], design probes [2], context-mapping [3] and design games [4]. Generative tools was firstly raised and put into practice by Liz Sanders in the US. It was then adapted by Pieter Jan Stappers of TU Delft, where some PhD students employed the method and applied it into co-design practices, and context-mapping, a derivative of their own developed by Froukje Sleeswijk Visser when she was a PhD in TU Delft. At the same time, the Nordic researchers also explored co-design methods and tools, which help designers to gain more empathy on users (design probes by Tuuli Mattelmäki) and ease user participation during design process (design games by Eva Brandt).

In combination with co-design literatures of the Nordic countries and the Netherland, this retrospective study went through live interviews of respective co-design

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researchers. The experts are Pieter Jan Stappers, Froukje Sleeswijk Visser and Christine de Lille from TU Delft, Julia Cassim from the UK, Pelle Ehn from Sweden, Tuuli Mattelmäki from Finland and Eva Brandt from Denmark. They were selected because they have published work relating to co-design, and they were available for interviewing for the time specified. All the interviewees' responses on co-design will be synthesized using a general inductive approach.

After introducing the co-design expert interviews in Europe, the latter part of this paper will discuss the implications from the expert interviews for the co-design practices in China.

2 The Expert Interviews

By reviewing relevant literatures, a number of experts in co-design and participatory design fields were identified. The main purpose of the expert interviews was to map a larger picture of co-design through understanding the perspectives from various specialists and to experience in person how co-design is practiced in Europe. Finally this study attempts to establish shared practices which sublimate common principles and demonstrate different techniques which have been employed by these experts up until now.

All the seven interviews were conducted face to face and each lasted from one to one and a half hours. There was a questionnaire for the interview, which included two parts. The questionnaire started from simpler questions for letting both interviewees and the interviewer quickly immerge into the current scene, i.e., the definition of co-design, or name one most impressive co-design experience. Then it went into their practical experiences, i.e., they would be asked to name the advantages and the challenges when conducting co-design sessions, the useful tools and techniques which they have employed during co-design practices. All these interviews were conducted under different circumstances because of the time limitation, varied site conditions (some interviews were conducted in offices while others were during conference breaks) and varied interviewees' preferences (some preferred to talk beyond the confinement of the questions while others responded strictly within). In consequence, this expert interview study was an open one with clear motivations.

2.1 Methods of Analyzing the Expert Interviews

All the interviews were recorded and then transcribed. A general inductive approach [5] was employed to analyze the transcriptions. Essentially a coding method, such approach enabled an effective deciphering mechanism peeking into the miscellaneous of raw materials, through which seemingly irrelevant free talks can be extracted into meaningful categories. All the categories were then sorted out into two main parts, namely, the upper level of principles about co-design from the experts' perspectives and the lower level of the practical experiences and techniques of practicing co-design. The analysis proceeded in the funnel form (Fig. 1). Comparing with other qualitative analysis approaches, *the general inductive approach provides a simple, straightforward approach for deriving findings [5].* The coding process of the general inductive

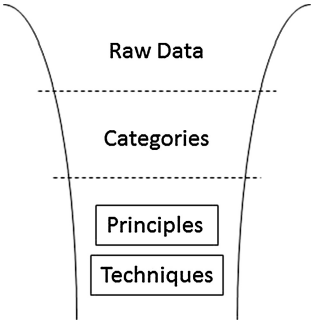

Fig. 1. The analysis funnel

Table 1. The coding process in inductive analysis (Adapted from [5])

Initial reading of text data	Identify specific text segments related to objectives	Label the segments of text to create categories	Reduce overlap and redundancy amount the categories	Classify the categories into the upper and the lower level
→	→	→	→	→
Many pages of text	Many segments of text	20 to 30 categories	12categories	6 categories in each level

approach is shown in Table 1. All the seven interviews were coded in sequence. Then the different categories from different interviewees were synthesized into two levels.

2.2 Findings of the Expert Interviews

According to the general inductive approach, twelve categories based on the transcriptions of the expert interview are summarized. Six categories are classified as the upper level of principles, namely, the definitions of co-design, the advantages and the challenges when practicing co-design, the most important factors when conducting co-design, whether the user and the designer have an equal status in co-design, being objective or not and perceptions on design probes. The other six categories are classified into the lower level of the practical experiences and techniques of practicing co-design, i.e., choosing users, engaging designers, how to use the co-design tools, being flexible, techniques for helping participants express themselves and perceptions on empathy. The synthesized categories are listed as follows.

The Upper Level: The Principles of Conducting Co-design.

Definitions of Co-design. Co-design literally means a design process that involves heavy collaborative efforts between the designers and the users to plan, adjust and

Table 2. Definitions of co-design

Interviewee	Definitions of co-design
Cassim	Co-design is that you are working with a group of people, based on equality and mutual interests. However, the creative direction and the design control have to be in the hands of the designer
De Lille	Co-design is an activity, in which the designer and the user collaborate to design a new product or service. The insights were gained through active collaboration and proactive participation among various stakeholders
Ehn	Co-design is an activity in which everything is designed with the user involved. It is like an umbrella word for all kinds of human-centred approaches, be it political or not Participatory design sprung from a different origin But the only academic conference about "Co-design" is called the Participatory Conference and the only academic journal in participatory design field is called "CoDesign". So contemporarily these are two nearly identical concepts
Mattelmäki	Four kinds of co-designs are categorized [6]. It started when the user's voice was accepted, then it went on to the development of the different kinds of tools that facilitated the user to express themselves, nowadays, not only the user, also other stakeholders were included in the co-design sessions
Sleeswijk Visser	Co-design is a design process when different stakeholders work together
Stappers	Co-design is a collaborative design process, typically when the users are involved throughout the entire design process. The users are put into the position of "experts", whose experiences the designers are interested in

facilitate the processing of a specific design endeavor [6]. Sanders and Stappers defined co-design as people designing together, an occasion when people collectively contributed their respective expertise as they participate in the design process [7]. When asked about their own definition of the co-design concept, these experts gave different responses (Table 2), which more or less reflected their own emphasis or interest of the concept. From their responses, two main trends can be observed about co-design. The first trend is that co-design and participatory design, though having different origins and at times different emphases, are becoming more and more overlapped in the contemporary view point. It is like what happened in between inclusive design and universal design, although they originated from different cradles, nowadays, they are just treated almost as if they are two different jargons about one same conception. The second trend is that co-design's purpose no longer ends at achieving better user experiences, it also has to put other stakeholders' interests into consideration.

The Advantages and Challenges When Practicing Co-design. All the experts' perspectives on this question are listed in Table 3. Organizing a co-design session is time and efforts consuming and expensive. However, just as Ehn said, things would not come out if not much time and efforts were spent. All these experts are experienced in co-design. De Lille believed that once the pre-work had been sufficiently done, the results would come naturally. However, for novices, how to handle unexpected or undesirable outcome is another challenge.

Table 3. The advantages and challenges when practicing co-design

Interviewee	The advantages	The challenges
Brandt	1. Design for the future	1. Greatly efforts consuming
		2. Lots of transferring work: Before going out: graphic work; After coming back: transform the raw field materials into design materials
De Lille	1. Co-design could accelerate the process because the designers could have users close by	
Ehn	1. It offers the chance for people to govern their own life	1. Time consuming
	2. It offers a chance to break the hegemony. It allows different voices and perspectives	2. There is no guarantee that results are good because of using co-design method
Mattelmäki	1. It brings different voices into the process, which could deepen the understanding	1. Time and resources consuming
	2. Often the involvement of non-designers helps develop	2. Users with high expectations prone to be disappointed
Sleeswijk Visser	1. If you get everything right, you get so much energy	1. Time consuming
		2. Find the right users with proper expertise.
Stappers	1. Bringing in the expertise of the user	1. Cost: time, efforts, skills, money
	2. Letting the user and the designer contact each other benefit both sides	2. The role of the designer sometimes is underestimated
	3. The end user might produce good solutions	

After synthesizing all these views, four advantages of co-design are found. First, it is more democratic as it enables the users to have their voices heard and influence the design outcomes, which later would directly impact their lives. Secondly, incorporating user ideas into the design process sometimes can be really helpful. Thirdly, with the help of the user, the designer could identify the crucial parts more accurately and quickly, thus easing the process. Fourthly, by introducing the design games, it triggers imagination that inspires designs which challenge the contemporary design norms.

The Most Important Factors When Practicing Co-design. Table 4 lists the key factors that the interviewees had contributed. They explained the essentials of co-design. It gives an outline for novices to follow.

When Brandt was preparing a design game, she always put every participant's interests into consideration and so she would have a rough idea about what he or she would like to gain from the workshop. Her focus was always on how much more engaging after the design game was introduced to facilitate a design project. Cassim

Table 4. The most important factors when practicing co-design

Interviewee	Factors
Brandt	How to engage every participant: carefully consider every participant's interests and what he or she wants to gain
Cassim	Context, budget, skill bases and the expected outcomes
De Lille	The most important qualities that co-designers need to have: Open-minded, curious, flexible
Ehn	Building trust: equality and mutually beneficial, a two way empathic relationship between the designer and the user
Mattelmäki	Treat users as humans not as research subjects; be sensitive
Sleeswijk Visser	Choosing the right users with proper expertise
Stappers	Giving some part of control to the user; Users were given certain freedom and assistance to identify the problems for themselves and even provide a solution

considered context, budget, skill bases and the expected outcomes were the four key factors for conducting co-design. Besides, clearly defining the role of the designer and the user was very important. De Lille shared her thoughts on the desirable qualities that a co-designer needed to have, i.e., a person who is open-minded, full of curiosity, being able to be flexible. Ehn highlighted the importance of building mutual trust when conducting co-design. According to his observation, empathy was often considered to be the sole responsibility on the designer's part, while trust emphasized a mutual and equal relation between the designer and the user. Mattelmäki believed that it is very important for a designer to be able to treat his or her users as human-beings, not as research subjects in a scientific experiment. Sleeswijk Visser considered choosing the right users with proper expertise was the key factor when conducting co-design. In co-design, users are put into the position of "experts" about their own life. Hence, Stappers believed that giving out certain part of control to users would be the key and the most difficult part when practicing co-design. Instead of the designer identifying the design problems for the user in the very beginning of a design process, they were given certain freedom and assistance to determine the issues for themselves and sometimes even provide a solution. When users were given some part of control, they felt their "expertise" was valued, in return they would be more inclined to collaborate with the designers to see the design process through.

Whether the User and the Designer Have an Equal Status in Co-design. De Lille and Cassim both believed that designers or researchers should take the absolute leading role in the co-design process. *"Users will never be equal partners in the design process" (from the interview of De Lille).* De Lille explained her comment, as she encountered frequently users who were just unable to image beyond the prototypes in hand. Such inability of broadened thinking can be attributed to lack of training in design fundamentals (e.g. the textile and the texture). Interaction with such users could not provide the designers with the radical insights he or she hoped to gain. In the

interview with Cassim, she frequently mentioned that in order to ensure a pleasant quality of the design outcome, the designers should have a firm control over the bearing of the direction of design innovation. Cassim categorized co-design into four main types (Table 5), which reflected four kinds of designer-user relationships. And in most of these four scenarios, designers dominated the design process. Before the co-design session, the capabilities of users and the conditions in which the co-design session was going to be carried out would be carefully defined. As a result, the context of the design project would be put under control.

Table 5. The four types of co-design that Julia Cassim conducted

	Type 1	Type 2	Type 3	Type 4
People	Designers/Skilled but socially marginalized people	Designers/Addicts	Designers/People with learning disabilities	Designers/Disabled people
Roles	Creative directors and Understand the context/Makers	Creative directors and Makers/No skills	Design a template/Simple scribble	Design with the insights and expertise from disabled people/Offer lots of inputs, but do not design
Relations	An equal level of talents	Not an equal level of talents	Not an equal level of talents	An equal relation

Being Objective or Not. Both Sleeswijk Visser and Brandt maintained that it is not a necessity for researchers to be completely objective during co-design sessions. According to Sleeswijk Visser that being objective is not the purpose of a design process, trying to collaborate with users and ultimately having something created is. Sometimes absolute objectivity can be misleading, especially when the research objects are human beings, it is better to rely on one's own experiences on user research and pay more attention on deciphering the quotes of users which were deemed to be important. *"We do not say we are objective. We say we cannot be" (from Brandt's interview).* When Brandt was trying to incorporate the design game into the design process, what was on her mind wasn't how objective the design game was but rather how engaging, and that is why she also took part in the game herself.

Perceptions on Design Probes. As the pioneer of design probes, Mattelmäki explained her perceptions on it. First, she distinguished cultural probes [8] from design probes. Cultural probes were much more artistic while design probes were used as an element for evoking a dialogue, which were more empathy related. Secondly, the design probe was not only a tool, but also a process of learning, reflecting and for engaging participants. Thirdly, in the probe package, both the previous experiences of users and the potential future could be collected, just depending on how the probe package was designed.

The Lower Level: The Practical Experiences and Techniques of Conducting Co-design

Choosing Users. In regard to whom should be invited to participate in co-design sessions, Stappers believed that people of expertise to the design issue are desirable invitees. He gave an example to illustrate his definition of the expertise. In an effort to better run the operating rooms in a hospital, besides surgeons, nurses, patients and hospital administrators, the involvement of the cleaning staffs was vital as well. In terms of expertise, they have a distinctive advantage comparing to other seemingly more important partakers, they were much closer to and spending more time in the operating rooms. Sleeswijk Visser tended to regard people who have a passion on the relevant design topics as her desirable invitees. Brandt took the familiar view of Sleeswijk Visser that she preferred to invite the ones who were open, willing to participate in the topic. De Lille and Cassim also contributed their respective preferences of desirable participants. *"Thinking out of the box, who can provide you with interesting information…really think broader" (from De Lille's interview).* De Lille made a point that besides the primary users, the secondary users were also needed consideration. De Lille mentioned a project to improve the safety of stairs. A tour guide who was working in a church tower with 400 stairs was invited as an "expert" of narrow winding stairs. Cassim gave an example about participant selection when she was organizing a co-design session for designing shoes which are not only comfortable but attractive for women with rheumatoid arthritis. She invited one shoe designer, one product designer, one orthotist and one podiatrist. Three female rheumatoid arthritis patients of varied severity, different age groups and life styles were invited. Cassim had hoped to have two kinds of scenarios run simultaneously, i.e., a disability scenario and a life style scenario.

In order to cultivate a relaxed and genuine atmosphere, Stappers deliberately invited participants who were total strangers to one another as people have less if any pretence in front of strangers. A hierarchical relationship between superiors and subordinates would only hinder a genuine exchange of ideas while tacit understanding in between family members could result in an effective communication.

All in all, there are four main considerations when choosing participants; the first one is trying to find out who are the "experts" on the design topic; the second one is trying to think broader than the stereotypes; the third one is to invite the people who are open-minded and interested in the topic; finally, when considering the composition of a group of diversified participants, the people with latent understanding and can communicate freely are desirable invitees.

Engaging Designers. Sleeswijk Visser believed that only curious designers can adopt an empathic attitude towards users. She talked about two effective ways to motivate designers. The first one is trying to encourage designers to talk about their own experiences. Kouprie and Sleeswijk Visser termed it as the "connection" phase of the four phases of gaining empathy [9]. The second one is trying to avoid overloading, because designers seldom have time and patience to bear a long presentation of a bit of everything. To keep them curious, it would be better to show them ten pictures within half an hour.

How to Use the Co-design Tools. Several co-design tools were mentioned earlier in the introduction of this study. Though these tools are appealing in manifestation and look a promising solution to all the problems which could be encountered in the co-design process, all experts who commented on design tools tried to disregard the prominence of these tools if one doesn't know why, when and how to apply them. *"I think more important is in what way you will collaborate and who will you involve in… Skills and techniques are more important than tools" (from the interview of Stappers). "We should not just consider this kind of tool like probes… but it's really we should consider the competences, the processes, the whole engaging process" (from the interview of Mattelmäki)."I like tools for the specific situation"(from the interview of Sleeswijk Visser).* All these quotations reflected that these experts would not allow themselves to the confinement of these design tools, if they are irrelevant to the overall goal of the design project.

Regarding application of tools in co-design, Sleeswijk Visser asserted another view that a designer should have the awareness of incorporating multi-disciplinary tools to solve the design problem, especially in commercial design project when the deal is real. As she mentioned in a commercial project she leaded, in order to gain a fuller picture of the problem in hand, she summoned a team consisting of experts from different fields, e.g., engineers, psychologists, pharmacists. Each expert was given a slice of the problem which concerns the professions of that expert, and they were allowed to handle that slice of problem in their own professional manner, the result of such cross disciplinary collaboration was rather a success. Therefore it is always useful to approach a problem from a broader perspective.

There is another aspect when talking about co-design tools, which virtually every expert had mentioned in their respective interviews. "Flexibility".

Being Flexible. "Flexibility" meant that the tools had to be implemented according to the current situations and context. *"Being flexible and take your freedom. If this does not work, try something else and move on" (from the interview of De Lille).* De Lille gave an example, that during work hours, nurses seldom have time to join the designers for an interview session; therefore it is much more feasible to offer them something which they can complete during breaks, like place a white board with all the design issues listed as concise multiple choices for them to fill. Based on her experiences collaborating with small companies, De Lille believed that it is very important for designers to maintain a fresh perspective. Once a method or tool was met with resistance and found incompatible with the current situation, instead of insisting on the old method or tool, new ones must be tried. In Mattelmäki's view, the most important quality for a designer to possess was to be sensitive rather than being scientific and rigorous to the users. Stappers described the features of co-designing as variable, complex, unstable. He observed that once a co-design session got on the way, it proceeded according to the ever changing complexes of the situation and the instinctive and internalized experiences of the designers or the researchers. From the four types of co-design Cassim categorized, different users would be measured up and classified into different levels of capabilities, each and every design context would be carefully examined to make the whole co-design process controllable. To facing with ever-changing design context and situations, flexibility and adaptability are two very

important qualities for a designer to possess. De Lille and Mattelmäki both suggested using design games to conduct co-design session, as it could be set the game rule flexibly according to the design purpose and the current conditions.

Techniques for Helping Participants Express Themselves. During co-design session, facilitating participants to express themselves was a challenge in practice. Different experts shared their experiences (Table 6).

Table 6. The techniques for helping participants express themselves

Interviewee	Techniques
Stappers	1. Using ambiguous pictures (learned from Liz Sanders)
	2. The Focus-Scope rule: when focusing on the narrow topic, talk about the broader topic to keep the conversation on
	3. Pay attention to the group dynamics: do not ignore the people who are not talkative, maybe they are good thinkers
	4. Facilitators must feel secured and encourage one of the participants to talk. Once one person broke the ice, the other participants would be more willing to join in
Cassim	1. Invite a visualizer special for users to express their ideas simultaneously
	2. Let users "make" than "draw": users are more confident when they construct something than drawing
Brandt	Adopt a turn taking rule in the design game to give everyone a chance to talk

Perceptions on Empathy. De Lille and Mattelmäki both held the view that empathy is an innate quality, which all people have a varied inheritance. Kouprie and Sleeswijk Visser divided the techniques of gaining empathy into three main classes [9]. Communication techniques [9] were the most widely used ones, for example, storytelling, visual data and original quotes. The process of gaining empathy in design practice consisted of four phases, namely, discovery, immersion, connection and detachment, in which a designer steps into the life of a user, trying to put his or her feet into the user's shoes and then detaches out of the life of that user with a deeper appreciation of the life of that individual. Sleeswijk Visser answered the question why designers had to step out of the life of the user to conclude the empathic process. *"At that moment, designers have to create something new. The mechanism of creativity is different from that of empathy, in which designers try hard to understand someone else really well. Once the designers have sufficient understanding, just leave them there and start designing. When the brainstorming mode is turned on, designers cannot understand the user deeper. I do not mean that the user is useless at this stage. They are still there. But the designers just stop trying to deepen that empathic understanding" (from the interview of Sleeswijk Visser).*

3 The Implications for China

The co-design concepts were formally introduced to China since around 2012. Subsequently two co-design workshops between professional designers and diverse users and a co-design project as a module among undergraduate students were conducted [10, 11]. From these practices, certain experiences had been accumulated while some obstacles were encountered, for example, how to properly use the co-design tools; how to effectively engage the participants, what kind of relation that the designer and the user have, etc. Through analyzing these findings from the expert's interviews, certain vague zones had been clarified according to the European pioneering experiences. The summaries of the second part can be regarded as a great attempt trying to answer the questions and the main perceptions from the synthesis are concluded as following.

- There is no need to be scientifically objective when conducting co-design.

> *"I argue for the importance of the designer's or researcher's role in making sense of an ongoing discussion, and the need to project her or his interpretations onto it and to orient it towards the design direction that she or he finds relevant." [12]*

Based on the perceptions from the interview, proper intervention is better than being absolutely objective.

- There is not a monotonous tool and rule. The researchers and the designers have to be very flexible according to the context and the conditions. Slightly change the prepared agenda according to the participants' conveniences.
- Get used to the uncertainty and ambiguity of the creative design process, especially at the early stage. Keep the purpose and the expected outcomes of the project in mind. Do not spend much time on the forms.
- Pay more attention on the participants' preferences, feelings and characters to engage everyone to be passionate in the co-design session.

4 Conclusions

This study has explored the concept of co-design through interviewing seven experts in Europe. Each expert has his/her own view on co-design, but consensus was observed, 1. Co-design and participatory design are regarded as interchangeable by the experts. 2. Different stakeholders (rather than just the end users) are brought into the co-design process. A number of key factors for practicing co-design were identified (as listed in Table 4), and each expert has his/her own viewpoints, which suggest that it is important for the individual researchers to practice co-design in his/her own way as appropriate. Practical guidance on co-design techniques was proposed, with specific tips for student researchers practicing co-design in China.

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