DEVELOPING A CO-DESIGN METHOD FOR ELICITING CHILDREN'S
NEEDS AND PREFERENCES IN THE CONTEXT OF INDUSTRIAL DESIGN
EDUCATION

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submitted by **SILA UMULU** in partial fulfillment of the requirements for the degree of **Master of Science in Industrial Design Department, Middle East Technical University** by,

Prof. Dr. Gülbin Dural Ünver
Dean, Graduate School of **Natural and Applied Sciences**   _____

Prof. Dr. Gülay Hasdoğan
Head of Department, **Industrial Design**   _____

Assist. Prof. Dr. Fatma Korkut
Supervisor, **Industrial Design Dept., METU**   _____

Examining Committee Members:

Prof. Dr. Gülay Hasdoğan
Industrial Design Dept., METU   _____

Assist. Prof. Dr. Fatma Korkut
Supervisor, Industrial Design Dept., METU   _____

Assist. Prof. Dr. Pınar Kaygan
Industrial Design Dept., METU   _____

Assist. Prof. Dr. Naz A.G.Z. Börekçi
Industrial Design Dept., METU   _____

Assist. Prof. Dr. Aykut Coşkun
Dept. of Media and Visual Arts, Koç University   _____

Date: _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Sıla Umulu

Signature   :

ABSTRACT

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Umulu, Sıla
M.Sc., Department of Industrial Design
Supervisor: Assist. Prof. Dr. Fatma Korkut

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Children as users and designers as adults who design products for them have distinct intellectual advancements as well as different ways of experiencing the world. Therefore, inviting children to the design process as partners is very important for developing an understanding of this special user group. This study addresses the early phases of design process in the context of industrial design education and proposes a co-design method for supporting undergraduate industrial design students' eliciting children's needs and preferences. Firstly, in order to develop a method for co-designing with children, a literature review was conducted to investigate the existing methods. After developing a co-design method, a field study was conducted within the scope of an undergraduate industrial design studio course. The field study involved a co-design session with 51 industrial design students and 24 third grade primary school children, and face to face post-session interviews conducted with the design students to receive feedback about their experiences with the children and the co-design method utilized. The study indicates that the proposed co-design method is supportive for industrial design students in eliciting children's needs and preferences. On the other hand, the challenges experienced by design students during the co-design session and the post-session design process indicate the aspects of the method which require further improvement. The study concludes with the suggestions for improving the procedure and the implementation of the co-design method.

ÖZ

ENDÜSTRİYEL TASARIM EĞİTİMİNDE ÇOCUKLARIN İHTİYAÇ VE TERCİHLERİNİ ANLAMAYA YÖNELİK BİR ORTAK TASARIM METODU GELİŞTİRİLMESİ

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Kullanıcı olarak çocuklar ve onlar için ürün tasarlayan yetişkinler olarak tasarımcılar, dünyayı farklı biçimlerde deneyimlemenin yanı sıra farklı entelektüel niteliklere sahiptirler. Bu nedenle, çocukların tasarım sürecine katılımcı olarak davet edilmesi, bu özel kullanıcı grubu hakkında bir anlayış geliştirmek açısından büyük önem taşır. Bu çalışma, endüstriyel tasarım eğitiminde tasarım sürecinin erken aşamalarını ele almaktadır ve çocukların ihtiyaç ve tercihlerini anlamalarında endüstriyel tasarım lisans öğrencilerine yardımcı olacak bir ortak tasarım metodu önermektedir. Bir çocuklarla ortak tasarım metodu geliştirmek amacıyla, çalışmada ilk olarak, mevcut yöntemleri serimleyen bir alanyazın taraması yapılmıştır. Bir ortak tasarım metodu geliştirdikten sonra, bir endüstriyel tasarım lisans stüdyosu dersi kapsamında bir alan çalışması gerçekleştirilmiştir. Alan çalışması, 51 endüstriyel tasarım öğrencisi ve 24 ilköğretim üçüncü sınıf öğrencisi ile birlikte gerçekleştirilen bir ortak tasarım etkinliğini içermektedir; ayrıca, ortak tasarım etkinliği sonrasında, tasarım öğrencilerinin çocuklarla çalışma deneyimlerini ve kullanılan ortak tasarım metodu hakkındaki görüşlerini öğrenmek amacıyla 24 tasarım öğrencisiyle yüz yüze mülakatlar yapılmıştır. Bu çalışmada geliştirilen ortak tasarım metodunun, çocukların ihtiyaç ve tercihlerini anlamalarında endüstriyel tasarım öğrencilerine yardımcı olduğu belirlenmiştir. Öte yandan, tasarım öğrencilerinin ortak tasarım etkinliği sırasında ve etkinlik sonrasında tasarım sürecinde yaşadıkları güçlükler, metodun iyileştirilmesi gereken yönlerine işaret etmektedir. Araştırmanın sonucunda, bu çalışmada geliştirilen ortak tasarım metodunun içeriğine ve uygulama sürecine yönelik öneriler sunulmuştur.

Anahtar kelimeler: ortak tasarım, çocuklarla ortak tasarım, katılımcı tasarım, tasarım eğitiminde ortak tasarım, endüstriyel tasarım eğitimi, tasarım metodları

To my little cousin Nisan

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CHAPTER 1

INTRODUCTION

1.1 Background

Over ten years, there has been a dramatical shift from user-centred design approach to participatory design approach in design research. This shift has led to radical changes in the role of the user, as well as the designer and the researcher in the design process. Contrary to the classical user-centred approach in which the user is a passive object of the study, co-design allows the *user* to take an active role in the design process and to contribute to the design as an equal stakeholder and the true expert of everyday life experiences (Sleeswijk Visser et al., 2005). The role of the *researcher* shifts from informing designers by collecting and analyzing the data to providing tools for facilitating the processes of ideation and creation. Moreover, the role of the *designer* shifts from passively gaining knowledge from researchers to collaborating with the researcher to develop tools, and to facilitating the engagement of the user (as a partner) in the creative process (Sanders, 2008). This role required designers to consider the users as co-creators in the design process. Adopting this mindset can be considerably difficult for designers, as it is relatively different from the expert mindset in which the designer is the only one to find solutions to the problems (Buxton, 2007). However, the fact that wicked problems designers faced today can not be solved by a mere individual has led them to move to the participatory design mindset and invite users in the design process as co-designers (Sanders & Stappers, 2012). This approach provides designers with a better understanding of the needs, preferences and dreams of the user while finding design solutions together with users.

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Among all the users, children are the ones whose contribution to design is critically needed, because children as users and designers as adults (who design products for them) have distinct intellectual advancements as well as different ways of experiencing the world (Melanio & Gennari, 2013). As Druin (1999) mentions in her article "it is not easy for an adult to step into a child's world, and likewise it is not easy for a child to step into an adult's world". Moreover, children have a creative mind which can generate unlimited amount of ideas and thoughts about everything they encounter in their lives, and they do not hesitate to share even their wildest ideas with others. These unique features make them natural co-design partners in industrial design. However, working with children as co-design partners is not an easy task. It requires a well-planned process utilizing methods and techniques suitable for or adapted to, this special user group's skills (Vaajakallio, 2009). To overcome the unique challenges of co-designing with children as design partners, several methods and tools have been developed such as "cooperative inquiry methods" including "mixing ideas" and "layered elaboration" developed by Allison Druin (Guha et al., 2004). Most of these methods are based on hands-on approaches and do not focus on children's natural tendency for playfulness and role-playing, the most important factors which promote creativity and a high degree of expression of thoughts and ideas (Giaccardi et al., 2012). To achieve this goal and to better understand user's needs and preferences, performative and narrative-based methods and tools are used for co-designing with children. However, the case studies utilizing these methods are limited to the area of child-computer interaction (CCI).

Along with the shift from user-centred design approach to co-design methodology, co-design has begun to be considered as an important frontier in design education and taught in industrial design programs (Saurus, 2012). The aim of integrating this approach into these programs is to encourage design students to use co-design processes to reach a better understanding of user needs in order to incorporate them into their concepts (Hanington, 2007). As Saure Hagen et al. (2012) emphasize, this approach enables designers to broaden their horizons by getting them into children's

creative, imaginative and playful world which is full of unimaginable ideas. However, the co-design literature lacks guidelines, methods or tools supporting undergraduate design students for co-designing with children.

1.2 Aim of the Study

This study focuses on the gap in the literature concerning the methods and tools to support design students for co-designing with children, and argues that developing a co-design method utilizing children's natural tendency for playfulness and role-playing can facilitate design students' getting into children's world, and help them better understand children's needs and preferences.

The aim of this study is to explore co-designing with children in the context of undergraduate industrial design education, to investigate the potential of performative and narrative-based design methods. In order to achieve this, a co-design method for supporting design students' eliciting children's needs and preferences in the early phases of the design process is developed based on findings from the literature, and is tried out with privacy school children by undergraduate industrial design students.

Based on the aim of the study the main research question and the sub-questions are as follows:

- How can a co-design method be developed for the early phases of the design process to support industrial design students for eliciting children's needs and preferences?

  - What are the existing methods and tools developed for co-designing with children?

o How can these methods and tools be reinterpreted for developing a method to support industrial design students for co-designing with children?

o What is the potential of the method developed to support industrial design students for co-designing with children?

o What is the potential of the method developed to support the early phases of the design process for eliciting children's needs and preferences?

1.3 Structure of the Thesis

The first chapter of the thesis introduces the research topic, the aim of the study, and the main research question and the sub-questions.

The second chapter will present the literature review. In the literature review, firstly, participatory design, co-creation and co-design, the role of the users, researchers and designers in co-design will be reviewed. Secondly, the role of children in the design process and children as design partners will be reviewed. Lastly, review of existing methods and techniques utilized in co-design with children will be presented.

The third chapter will present the field study. In this chapter, development and implementation of the co-design method will be explained in detail. Then, the analysis of the outcomes of the analysis of the workshop materials and observations made during the workshop were presented. It continues with the interviews conducted with design students and findings of the analysis of the interviews. At the end of this chapter, limitations of the study will be explained.

The final chapter will present findings and conclusions of the study. Then, implications of the study for improving the method and for further research will be discussed.

CHAPTER 2

LITERATURE REVIEW

This chapter presents the review of the related literature and starts with an exploration of participatory design approach and the term co-creation and co-design along with the roles of the user, researcher and designer in co-design. Later, the role of children in the design process and children' role as partners will be explained. Finally, the review of existing methods and techniques developed for co-design with children will be presented.

2.1 Participatory Design, Co-creation and Co-design

2.1.1 Participatory Design

Participatory design has its roots in Scandinavia in the 1970s and is motivated by the workplace democracy movement (Spinuzzi,2005). This movement emerged as a response to the transformation of the workplaces as a result of the integration of computer systems into the workplace, which had caused a dramatic change in the work conditions of workers (Robertson and Simonsen, 2012). The aim was to give workers a voice in the design development process of those systems (Steen et al., 2007). Many leading projects (e.g. Due project in Denmark, Demos project in Sweden, UTOPIA project in Norway) and conferences (e.g. Design Participation in England) conducted in line with this aim planted the seeds of Participatory Design (Bødker & Pekkola, 2010).

Along with the technological developments, the context of participatory design spread out of the work environment (Mazzone, 2012) and different design fields such as urban

planning and architecture have adopted the participatory design approach. Moreover, participatory design field has developed over many years with its extensive collection of methods, tools and techniques, and constituted a root for many other research areas as a mindset. From 70's to now on, participatory design, as a mindset, has argued that people (users) are "experts of their experiences" and allowed them to take an active role in the design development process (Sleeswijk Visser et al., 2005).

2.1.2 Co-creation and Co-design

Since the beginning of the 21st century, in the zone of participatory design within the landscape of design research area, co-creation and co-design have been growing with a motto arguing that "all people are creative" (Sanders & Stappers, 2012). These two terms are often confused with one another. *Co-creation* refers to "any act of collective creativity", while *co-design,* that emerged as an instance of co-creation approach, can be defined as the collective creativity of designers and users working together in the design process (Sanders & Stappers ,2008).

Co-design allows the user to take an active role in the design process and to contribute to the design as an equal stakeholder and as the true expert of everyday life experiences (Slesswijk Visser et al., 2005). Moreover, it allows designers to learn about users' tacit (the knowledge that cannot be expressed in words) and latent (the ideas not experienced yet) knowledge by inviting them directly into the design process (Sanders, 2002). Latent and tacit knowledge are implicit and differ from explicit knowledge in that they cannot be expressed verbally (Polanyi, 1967). Gaining these levels of knowledge at which people's thoughts, feelings and dreams are located enables designers to explore users' experiences at a deep level (Sanders & Stappers, 2012) (Figure 2.1).

Today, co-design has grown to become a valued and common design methodology for many design practices. The problems designers face today are wicked, and addressing

and solving these problems cannot be managed by the designer individually (Strouse, 2013); according to Sanders and Stappers it is only possible through collective creativity (2012).
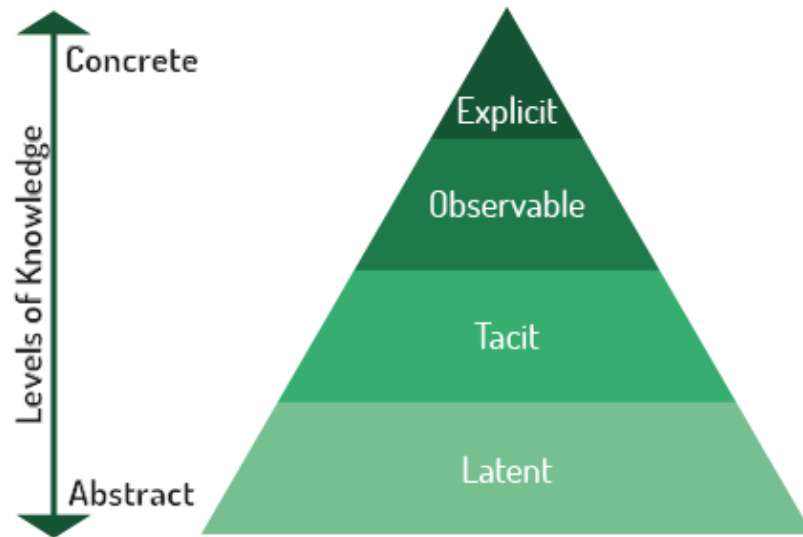
Figure 2.1 Levels of Knowledge (Adapted from Sanders & Stappers, 2012)

2.1.3 The Role of User, Designer and Researcher in Co-Design Process

The shift from user-centred approach to co-design approach has a considerable impact on the role of users, designers and researchers. Table 2.2 presents an overview of the roles in user-centred design and participatory design.

In the user-centred approach, *the user* is treated as passive objects which are observed in the context while *using* prototypes or *tests* already developed products to give feedbacks (Facer, 2004). Despite some advantages, these roles have a low level of contribution made by users. However, in co-design, the user is considered as partners and plays a huge role in generating design solutions. While this role provides the user voice in the development process of designs whose future users will be themselves, it

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gives huge responsibility to designers and researchers to provide appropriate tools for facilitating expression of their thoughts and ideas.

Contrary to the classical user-centred approach through which *the researcher* gains knowledge from theories and by making observations and interviews with users who are passive objects of the study, the role of the researcher in co-design process is to provide tools for facilitating the process of ideation and creation. As a facilitator, the researcher should foster users to be creative at four levels of creativity which are doing level, adapting level, making level, and creating level (Sanders & Stappers, 2012). Table 2.1 shows the levels of everyday life creativity with examples and support of the researcher at each level (Sanders, 2006).

Table 2.1 Levels of Everyday Creativity (Adapted from Sanders & Stappers, 2008)

	LEVEL	MOTIVATED BY	PURPOSE	EXAMPLE	RESEARCHER SHOULD
1	doing	productivity	"getting something done"	organizing my herbs and spices	lead people
2	adapting	appropriation	"making things my own" or "make it fit better"	embellishing a ready-made meal	guide
3	making	asserting my ability or skill	"make with my own hands"	cooking with a recipe	provide scaffold
4	creating	curiosity	"express my ability"	dreaming up a new dish	offer a clean slate

As Table 2.2 shows, in the classical user-centred approach, the designer does not include the process of data collection and analysis, in fact, receives it passively from the researcher. However, in co-design approach designers are in the role of facilitator and collaborate with the researcher to develop tools for facilitating the engagement of the user (as a partner) in the creative process (Sanders & Stappers, 2008). Moreover, designers provide specific skills and knowledge which the other partners cannot provide and which constitute utmost importance for the creative process and for forming the idea (Sanders & Stappers, 2012).

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Table 2.2 The Role of User, Designer and Researcher in Co-Design Process

ROLES		
	User-centred Design	**Participatory Design**
Researcher	Expert – Bringing knowledge from theories – Developing more knowledge through observation and interviews to inform the design process	Facilitator – Facilitating participants creativity and integration of the process by providing tool for ideation and expression
Designer	Receiver – Receiving knowledge from the researcher – Adding an understanding of technology and creative thinking for generating ideas or concepts	Facilitator – Facilitating participants creativity and integration of the process by providing tool for ideation and expression in collaboration with the researcher – Collaborating with the researcher in designing tools – Providing expert knowledge
User	Passive Object – User or tester of already developed products	Partner – Playing large role in knowledge development, idea generation and concept development as experts of their own experiences

2.2 The Role of Children in the Design Process and Children as Design Partners

In the literature of co-designing with children, the role of children in the design process is explained based on Druin's (2002) classification. In her paper "The Role of Children in the Design of New Technology", Druin (2002) states that children can be engaged in four different roles in the design process of technology: as a user, tester, informant and design partner (Figure 2.2). As *users*, children are observed, videotaped and tested while they are using existing technology. In this role, children contribute researchers to gain an understanding of the impact of existing technologies on children and their future needs. In the role of *tester*, children test initial prototypes of new technologies while researchers observe and ask them for comments on their experiences. As *informants,* children can be involved in different stages depending on the information researchers need to gain from children. Children can be a user, the tester of initial prototypes or they are asked for input or feedback after the development of a product.
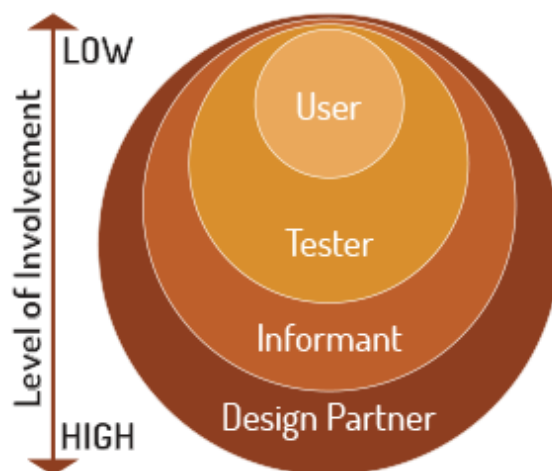
Figure 2.2 The Role of Children in the Design Process

By the mid 90's, the participatory mindset has started to emerge in the area of research with children. This shift has changed children's role in the design development process dramatically. Before 90's, children were considered as passive objects which are users and/or testers of readily developed products. With participatory mindset, children took

an active role as partners in the design process. children can contribute to design as equal stakeholders and as true experts of everyday life experiences. These contributions are critically needed to understand their needs which have to be fulfilled and to specify the requirements for the product.

2.3 Methods and Techniques for Co-designing with Children

After co-design were applied in the area of research with children, various methods have been developed for integrating children into the design process. As participatory design approach has its application in various fields, the terminology of participatory design is conflicting. Therefore, it is important to describe what the terminology used in this study refer to. In this study, Sander's (2010) descriptions of the key concepts of participatory design is adopted (Figure 2.3). As Sanders et al. (2010) mention in their article "A framework for organizing tools and techniques of participatory design":

- *Tool* refers to "the material components that are used in participatory design activities" (Sanders et al., 2010)
- *Technique* refers to the way "the tools and toolkits put into action" (Sanders et al., 2010)
- *Method* refers to "a combination of tools, toolkits and techniques" (Sanders et al., 2010)
- *Approach* refers to "the overall mindset with which the research plan is to be conducted" (Sanders et al., 2010)
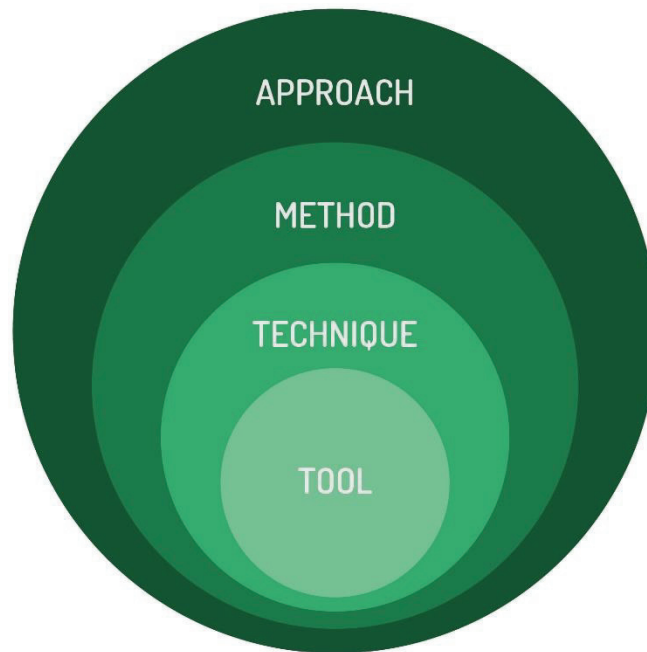
Figure 2.3 The Key Concepts of Participatory Design

Methods developed for co-designing with children can vary depending on the context and purpose of the research. Nousiainen (2008) mentions in her article "Children's Involvement in the Design of Game-Based Learning Environments", methods and techniques developed for co-design with children can be categorized based on the way by which researchers gain information from children as : observation-based methods, narrative-based methods, documentation-based methods, art-based methods, and game-based methods. As this study focuses on a co-design method utilized by industrial design students in the early phase of the design process, this section presents the most mentioned and used co-design methods and techniques developed for co-design with children in the early phases of the design process.

2.3.1 Observation-based Methods

These methods are used in the initial phase of the co-design process. The main aim is to gain an understanding of the users' actual work environment and their needs by observing and interviewing them while they are doing everyday activities. The main

example of the observation-based methods is contextual inquiry which is included in cooperative inquiry methods.

Contextual Inquiry. This method is one of the cooperative inquiry methods and aims to observe users' activities in their actual work environment. Contextual inquiry was used by Druin (1999) in co-designing with children to gather information by observing and interviewing children while they are using existing technologies. The method differs from the classical contextual inquiry in that research partners are divided into two as note takers and interactors (Nousiainen, 2008). The main purpose of this division is to make children feel more comfortable.

In Druin's study (1999), both children and adults had equal chances to be a part of collecting data, making observations and taking notes. The notes were taken through drawing, videotaping and writing. During the study, they realized that note-taking techniques of adults and children are different in that the adults preferred writing whereas children chose to explain by drawing. In addition, the adults wrote down all the details of the conversations and activities whereas the children summarized the data. This was helpful for the adult partner to catch ideas which remained unnoticed.

2.3.2 Narrative-based Methods

Narrative methods have the purpose of facilitating expression and verbalization of the views and ideas of users. These methods have been developed to overcome the challenges of interviewing which is the most commonly used user research method. Children have difficulties in putting their ideas into words and can easily be affected by the interviewer in that they provide answers which they think the interviewer wants to hear. They may also resist answering questions because of the stress caused by the fear of giving the wrong answer. These methods deal with these challenges by supporting children to express their ideas by turning the requirement gathering phase

into a fun activity. Narrative methods include Embodied Narratives and Mission from Mars.

Embodied Narratives. This method includes embodied and performative techniques which take advantage of children's natural playfulness to encourage to use their body to express everyday life activities and generate design ideas (Giaccardi et al., 2012). The name of the method comes from the main aim of it, that is, encouraging children to "build narratives out of the things they perceive and observe performatively" (Melanio & Gennari, 2013), and it offers an iterative process including five main activities which are brainstorming, performing, shooting, printing, and sharing.

The article "Embodied Narratives: A Performative Co-Design Technique" (Giaccardi et al., 2012) reports an empirical study conducted with 8 children aged 10-11 in which the Embodied Narrative method was used. The aim of the study was to design a social game in order to teach children how to respond to emergency situations that may occur in home. The children were divided into four groups, and each group is given a digital camera with a built-in printer and film. In the brainstorming phase, children observed their environment including objects and people to generate ideas. In the second phase, they prepare a scene together and perform the risky situation. During the performing phase, they took photos and then print them out. In the last phase, they shared their print outs with others by making a storyboard. After the sharing phase, they again started brainstorming about their next performance. This study shows that performance as a co-design tool enables children to use their natural playfulness and encourage social interaction, and thus, promote creativity and a high degree of expression.

Mission from Mars. This method was generated by Dindler et al. (2005), as a fictional inquiry method, to gain insights into the everyday life practices of children which they hesitated to express in a classical interview because they were too obvious. The aim of the study conducted by Dindler et al. (2005) is to gain insights about everyday activities of children associated with a school bag in order to compile the requirements

for designing an eBag. The narrative was about the Martians who don't know anything about life on Earth and want to learn about it from children. The Martians asked questions about life on Earth and about children's daily life activities especially at school. With the help of this shared narrative children could express their perceptions and interests in the context of a physical school bag.

2.3.3 Documentation-based Methods

Documentation-based methods serve to discover different aspects of the topic area and to gain information about the context by utilizing documentation techniques. These techniques are based on photos and notes collected by children during research. These methods include Kid Reporter and Networking News.

Kid Reporter. This method aims to gather requirements from children in order to design an educational game which informs children about the animals in a zoo (Bekker et al., 2003). This method enables children to be actively engaged in the requirement gathering activities. The case study utilizing the method was conducted with 63 children aged 9-10. In the study, each child was given one of the three roles as: reporter, photographer and writer. The role of photographer was taking pictures in a zoo and writing description of the reason for taking the photos. Reporters' role was to conduct interview with each other and to record the interview via tape recorder. Writers were divided into three groups, and each group select one among five topics proposed, then each group write an article about the topic they choose.

Networking News. The purpose of the method is to gain insight into user's interaction with each other and technology and to understand the use of existing and new technology (Nørregaard et al., 2003). To achieve this aim, the Networking news workshops were conducted with 6th grade and 7th year secondary school children. In the workshop children created an online newspaper about stories they choose; and were given the role of editor or journalist. Journalist groups conduct a field research

through interviewing and taking photos while editors received the findings of the field assignment and wrote the online paper. At the end of the workshop each group presents their papers and experiences they gained throughout the process.

2.3.4 Art-based Methods

Art-based methods are based on hands-on activities including mock-up and low-tech prototypes. These methods enable children to materialize their ideas and generate solutions. Most of the art based methods derived from Cooperative Inquiry (Druin,1999). Comicboarding, Mixing Ideas and Layered Elaboration are located in this category.

Comicboarding. Comicboarding aims to involve children who are not accustomed to brainstorming in productive brainstorming sessions (Morajevi et al., 2007). Contrary to the traditional story boarding which frustrates children due to its open-ended character, comicboarding uses a well-known comic character to define the theme and the constraints, and thus children feel more comfortable and willing to participate. Moreover, during the idea generation, an artist offers to draw for children in order to eliminate the frustration resulting from translating their thoughts into drawings and to make children solely focus on idea generation.

Mixing Ideas. This method aims to involve young children (aged 4-6) in co-design process and encourage effective collaboration among them (Guha et al., 2004). This method is composed of three stages. The first one is the observation stage in which children observe their classroom including objects and other classmates which they encounter with. The second stage is brainstorming in which each child works with one adult and expresses his/her initial ideas by drawing. The third stage is the mixing stage in which children are divided into groups and negotiate about each other's ideas. In the final stage, children mix their ideas into one big idea.

Layered Elaboration. This method aims to generate ideas through an iterative process in which children can express themselves creatively, and add or extend ideas without destroying the artefacts from the initial phase (Walsh et al., 2010). In the study conducted by Walsh et al. (2010) children were divided into groups of three, and there is one adult in each group. Each group was given the storyboard with a transparent paper on the top of it, and they start modifying the storyboard. When modifications finish, the transparent paper was removed and replaced with a new one. After all the groups finish the process, each storyboard and transparent overlay is hanged on board in order to discuss.

2.3.5 Classification of Methods and Techniques for Co-designing with Children

Many attempts have been made to classify methods and techniques developed for co-designing with children. These classifications vary depending on the dimensions to which they are related and aim at constituting a resource for future design sessions. As Mazzone et al. (2011) mention in their article "Towards the framework of co-design sessions with children" that utilizing different techniques in co-design sessions provides children with various ways to express themselves, and thus facilitates creativity and idea generation. In achieving this, it is important to have an overall view of the techniques and methods utilized in co-design sessions including their objectives, the design stage in which the session will be integrated, required participant skills for these activities, and finally, pros and cons of these techniques and methods (Mazzone et al., 2011). Therefore, in this study, the researcher built a methods matrix including eight methods briefly explained in the previous sections (Table 2.3). Similar to the previous classifications mentioned, the methods matrix table includes the main purpose of the method/technique, the activities included, the age of the participants, the skills required, the design field in which these methods and techniques were utilized, and pros and cons. The methods/ techniques are classified under four major groups. The first column of the matrix shows the groups of the techniques and methods adopted from Nousiainen (2008) as mentioned in the previous chapter. The second

column displays the methods and techniques discussed in previous sections. The third and fourth column demonstrates the main purpose behind utilizing the methods or techniques, and major activities included. The fifth column shows age range of children participants who participated in design sessions utilizing the methods and techniques. The next column illustrates participants' skills for fulfilling the activities determined by Sluis-Thiescheffer et al. 's (2011)classification based on the theory of Multiple Intelligence (Gardner, 1993). They group methods into three skill types as communication skills including linguistic and interpersonal intelligence, design specific skills including communication skills, spatial visual and bodily-kinestetic intelligence, and method specific skills including logical-mathematical, musical, intrapersonal etc. The last two columns displayed advantages and disadvantages of the methods and techniques.

Table 2.3 Methods Matrix

	Methods/Techniques	Main Purpose	Major Activities	Age	Skills	Design Field	Pros	Cons
Observation-based Methods	Contextual Inquiry	- Understanding user's context and activities.	- Observing - Interviewing - Taking notes - Drawing	4-7	L, I	CCI	Enables to gain insight into children's perspective on context and use	Requires too much time, requires too much effort to analyze the data
Narrative-based Methods	Embodied Narratives	- Understanding user's perceptions - Understanding user's experiences	- Brainstorming - Performing - Taking photos - Verbalizing experiences to the others	10-11	B, V/S, L, I	CCI	Facilitate children's expression of perceptions by boosting their playfulness	Expensive, difficult to document, need careful supervision
	Mission from Mars	- Understanding user's context - Gaining insight into the use of existing systems related to the context - Understanding the personalization and customization of existing systems	- Decoding signals - Discussing what to present - Preparing for presentation - Presenting the materials	10-11	L, I	CCI	- Playful and engaging - Enable to ask questions that otherwise would be too self-evident when asked in interviews	Require lots of electronic equipment, require two rooms appropriate for using these equipment
Documentation-based Methods	Kid Reporter	- Understanding user's interests and preferences	- Taking photos - Interviewing - Writing articles - Filling questionnaires	9-10	V/S, L	CCI	- Engaging - Enable to gain solid and strong insights by utilizing various methods.	Require too much effort in planning the process and analyzing the data, requires many assistants
	Networking News	- Gaining insight into user's interaction with each other and technology - Understanding the use of existing and new technology	- Taking photos - Interviewing - Writing articles - Presenting articles to the others	13-14	V/S, L	CCI	Enable to gain insight into user's interaction between themselves with technology in real-life setting.	Require lots of electronic equipment, expensive
Art-based Methods	Comicboarding	- Eliciting design ideas from users	- Drawing - Generating ideas	6-13	B, V/S	UID	Facilitate creativity of children who are not accustomed to brainstorming.	Cause biased ideas, limit the range of ideas, difficult to find a proper artist
	Mixing Ideas	- Eliciting design ideas from users	- Observing - Individual idea generation - Mixing individual ideas	3-6	V/S, L	CCI	Support collaboration between young children	Requires careful and extra/more adult facilitation, requires too much time
	Layered Elaboration	- Eliciting design ideas from users	- Drawing - Generating ideas - Modifying other's ideas	7-11	V/S, L	CCI	- Enable to modify ideas without damaging it. - Low cost and portable	Cause participant's loosing attention while presentation which results in less modification

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CHAPTER 3

FIELD STUDY

This chapter presents the development process of a co-design method for supporting industrial design students' eliciting children's needs and preferences in the early stages of design process, its implementation in the form of a co-design session conducted with junior year industrial design students and primary school children, the post-session interviews conducted with the design students, the findings of the field study, and the limitations of the study.

3.1 Research Design and Methodology

This study comprises two main stages. The first stage is *developing the method* which aims to develop a co-design method for supporting design students' eliciting children's needs and preferences in the early phases of design process and involves the literature review, the methods matrix, and the proposed co-design method. The second stage is *implementing and evaluating the method* which aims to explore and understand the theoretical and practical implications of the proposed co-design method, and involves the co-design session, the post-session interviews, and data analysis and findings (Figure 3.1).
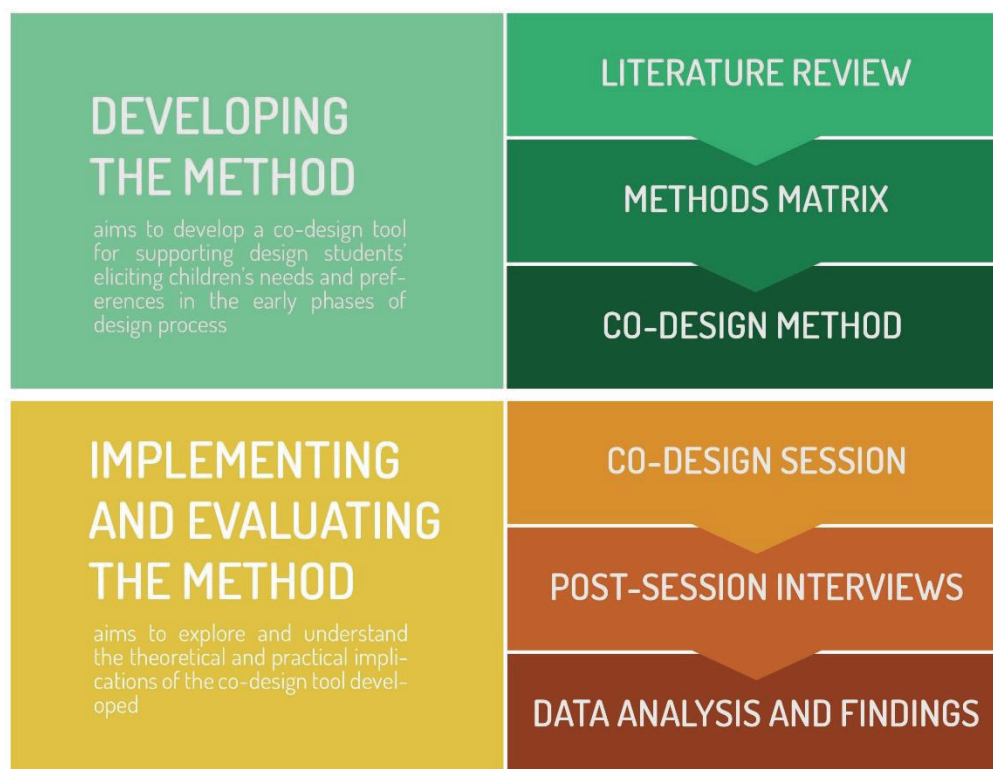
Figure 3.1 The Main Stages of the Study: Developing the Method, and Implementing and Evaluating the Method

The literature review in the first stage aims to gain knowledge about the co-design approach, and methods and techniques for co-designing with children. This knowledge constitutes the basis for developing the co-design method. However, the review of existing co-design methods and techniques integrating children into design process requires an analysis on a different level before it can be utilized for the development of a co-design method. Therefore, in order to draw a holistic view, eight methods were analyzed in terms of relevant considerations and features including the main purpose of the method/technique, the activities included, the age of the participants, the skills required, the design field in which these methods and techniques were utilized, and pros and cons, and presented in the form of a methods matrix (Table 3.1). The methods matrix provides a guide through which one can grasp quickly and comparatively the key features of the methods and techniques analyzed.

The proposed method was based on the methods matrix, and finalized along with the specific requirements of the co-design session which were integrated into an ongoing industrial design studio project and involved junior year industrial design students and primary school children.

The second stage aims to implement and evaluate the proposed co-design method in terms of its theoretical and practical implications. This stage includes the core elements of the research as the design session conducted with undergraduate industrial design students and 3rd grade primary school children at primary school by utilizing the method, and the post-session interviews take place at this stage; the observations made during the session, the resulting session material, and the interviews conducted after the session constitute the primary data to be analyzed.

3.2 The Co-design Session: Washbasin and Accessories Designs for Primary Schools

This section explains the background and the phases of the educational project conducted within the scope of the junior year industrial design studio course (ID 301 Industrial Design III) at Middle East Technical University Department of Industrial Design (Ankara, Turkey). The project was conducted during the 2016-2017 fall semester; 51 students were registered for the course, and 12 teams consisting of 4-5 students were formed randomly. The project was titled as "Sustainable hygiene: Washbasin and accessories for primary schools in collaboration with Kale Group." The expected outcome of the project was a product family including the washbasin and the accessories related to hand and oral hygiene for primary school bathrooms. Children develop hygiene habits and skills in their primary school age period, between 6 – 10 years old. Primary school bathrooms may play a significant role in the development of these habits and skills as children spend most of their time at school. The project addresses the primary school bathroom environment in reference to these

product categories for building long-lasting hygiene habits, encouraging resource efficiency and product value, and enabling easy cleaning and maintenance.

Co-design, in the context of the project, was considered as the most promising approach for eliciting users' needs, preferences and dreams as well as observing their hygiene habits and skills (washing hands and brushing teeth) in the school bathroom context. Therefore, a design session utilizing the co-design method developed by the researcher was integrated into the fuzzy-front-end of the project, following the literature review and the field research, with an aim to reframe and reinterpret the project context by integrating the target users into the design process. The co-design session was conducted with 3rd grade industrial design students and 3rd grade primary school children in a school environment which was the context of the project.

3.2.1 Project Brief

As mentioned earlier, children develop hygiene habits and skills in their primary school age period, between 6-10 years old. These habits and skills include regular hand washing and tooth brushing, correct use of soap and toothbrush, and keeping and maintaining personal hygiene products such as a toothbrush, toothpaste, soap, and a towel. In this development process, primary school bathrooms have a significant role, as children spend most of their time at school.

Based on this background, the project aimed to develop sustainable solutions which promote long-lasting hygiene habits and resource efficiency, also enables easy cleaning and maintenance. A product family was expected as the outcome of the project. This family included the washbasin and all accessories related to the usage scenario such as the tap, holders for toothbrush, soap and towel as well as personal bags to be used by children.

The project emphasizes five design approaches throughout the process: enabling and engaging design, participatory design, resource efficiency, post-use, maintenance and cleaning, product safety and accessibility. Enabling and engaging design was considered as the one aiming to develop long-lasting hygiene habits through engaging interactions and personalization. Participatory design was integrated into the project to enable students to reframe and reinterpret the context by co-developing ideas, visions and dreams with the involvement of children. Resource efficiency intended to encourage responsible consumption (water and other sources) though changes in user behaviour and usage patterns. Maintenance and cleaning were adopted in order to enable replacement of outdated or worn-out systems both aesthetically and technically and to allow easy cleaning. And finally, product safety and accessibility was required to be taken into consideration while developing design solutions. The project brief can be explored in Appendix A in detail.

3.2.2 Project Phases and Calendar

The project consists of four phases: literature search, user observations and project dimensions, initial design exploration through collaborative research and participatory design, developing alternative design solutions and product lifespan scenarios, and final design and evaluation (see Figure 3.2). In the first phase, the student teams conducted a literature search on a specific topic assigned to them under four headings: materials and manufacturing, market research, safety and standards, kids and hygiene education. This phase also included initial user observations in domestic and school environment conducted by the student teams. In the second phase, initial design explorations and concept ideas are generated through an idea generation tool called the "Matrix" exercise and the co-design session. In the third phase of the project, alternative design solutions are generated with mock-ups and further developed through lifespan scenarios. In the final phase, the design solutions are finalized and presented through technical drawings and usage scenarios together with full-scale models of the product family.

Literature search, user observations and project dimensions	Students review the existing literature to gather knowledge and insights about primary and secondary users, manufacturing processes and materials, and the local and global markets. They also conduct interviews and observations at homes and schools to understand the user and the context. They analyze the visual and verbal data from this phase, and based on the major conclusions reached students develop project dimensions.
Initial design exploration through collaborative research and participatory design	Through collaborative research tools and participatory design workshops, students reinterpret and reframe the project context, and develop your initial ideas together with school children.
Developing alternative design solutions and product lifespan scenarios	Based on the previous phases, students develop alternative design solutions together with full scale mock-ups, further develop them through product lifespan scenarios, and detail those scenarios into product families.
Final design and evaluation	The teams will set up an exhibition collectively, present their finalized product family design together with product lifespan scenarios and full scale white models, and receive feedback from the tutors and the stakeholders.

Figure 3.2 Phases of the Project (Adapted from the project brief provided in Appendix A)

3.3 Developing the Method

This section explains the development process of the co-design method in detail. The process consists of three stages: defining the objectives, specifying location and duration, selecting participants, developing activities. It also describes important aspects taken into account while creating the method, including the aim of the students, the role of the participants, data collection methods, duration and location of activities and materials utilized for these activities. It should be mentioned that the development process was iterative because of the fact that during the process, opinions of the headmaster and teachers of the selected school and studio tutors were asked in different stages, and according to those opinions, modifications and revisions were made on the

method. However, those modifications will not be mentioned in this section in order not to create confusion or cause digression from the main topic.

3.3.1 Defining the objectives

The first stage was defining the objectives to be reached by the students through the use of the method, as all the dimensions of the session in which the method was integrated were designed for fulfilling these objectives. As mentioned earlier, the method was utilized in a session conducted in the context of an ongoing design project aiming to design washbasin and accessories for primary school bathrooms. The session was integrated into the project in the initial idea exploration phase with the aim of enabling students to gather user' needs, preferences and dreams. The main goal of the method was to enable students to gain insights into the following aspects:

- The context of design, i.e. school bathroom
- The use of existing products in the school bathroom, i.e. washbasin, tap, soap, tissue dispenser etc.
- Personalization and customization of products of bathroom context and of personal hygiene
- Users' habits and skills concerning hand hygiene and oral hygiene
- Users' ideas about future school bathrooms

3.3.2 Specifying Location and Duration

The second stage was determining the location and duration of the co-design session. Since the students needed to gather information about the context, the use of existing products in the school bathroom, and user's habits and skills concerning hand hygiene and oral hygiene, a school environment was the most appropriate location. Based on their previous experiences, the studio tutors decided to work with Ayşeabla Collage, a private primary school nearby the university campus. After getting permission from

the school headmaster, the studio tutors visited the school to investigate the environment, and to determine the date and duration of the session. As a result of the meeting, they decided that the time spent for the session required to be one and a half hours, between the end of lunch time (2 pm) and 4 pm, also the location of the session was specified as the library of Ayşeabla Collage.

3.3.3 Selecting participants

In this stage, the number and age of the participants were specified. The age of participants was specified in reference to the studies in the literature. According to the Druin's (1999) study, children aged between 7-10 considered as ideal design partners as they can "develop ideas from abstract concepts, yet be open to exploring new ideas". However, after 10 years old, children become conscious in "what is right or what is wrong", so set border to their unlimited creativity (Bruckman & Bandlow, 2003). Furthermore, 7 to 8 years old children are not accustomed to group work as active children have a tendency to overshadow the passive ones (Vaajakallio, 2009). All these facts led the researcher to specify the age group as nine, that is, 3rd-grade primary school children.

It is important to note here that except the age group, the number and composition of participants were mostly determined by the school headmaster and teachers. As the school headmaster preferred the participation of all students in one classroom rather than choosing students from separate classrooms, the number of children participating in the session had to be 24. Since there were 12 design student teams, the number of children per team was two. The selection of the classroom which would participate in the co-design session was also made by the teachers for the reason that they were acquainted with the student population and knew which classroom included more students who were accustomed to, or, had skills needed to participate in creative sessions.

3.3.4 Developing Activities and Selecting the Techniques

In this stage, the activities which formed the method were designed. In the design of the activities and selecting the techniques for the activities, the context of the project, objectives of the students and dimensions of the method specified before were taken into consideration.

3.3.4.1 Generating the Narrative

Since the aim of the study includes investigating the potential of narrative-based design methods in design students' eliciting children's needs and preferences, firstly, a narrative was generated through the sessions in which studio tutors and the researcher participated. As a result of the sessions, narrative utilized in Mission from Mars (MfM) technique (Dindler et al.,2005) was decided to be a source of inspiration for the narrative method would be utilized. The reason behind this decision lies in the selected method's main goal and the way it reaches this aim. As it was mentioned in the literature review section, MfM's main aim is to enable children to express their opinions and ideas about the issues which otherwise would be too self-evident to tell through ordinary interviews. It utilizes a shared narrative about Martians who want to gain insights into the context of which they do not know anything in order to ask even the stupidest questions to children. Personal hygiene activities, as the focus of the project, are also part of the daily routine and too self-evident. That's why utilizing a narrative like the one in MfM was considered as effective in terms of gaining insights into children's needs, preferences and dreams about personal hygiene products in primary school bathrooms. Hence, a narrative was generated for the method with studio tutor's counselling. The narrative was about the Martians who decided to construct a primary school for children visitors from Earth in Mars and contacted METU Industrial Design Department students to help them. Besides the main aim of facilitating expression, the narrative made children feel like part of the design team by assigning the children the role of researcher and/or designer consulted by Martians. To maintain the consistency, all activities were designed considering this narrative.

In the process of establishing the narrative, a decoding activity was decided to be utilized in which children were asked to translate signals sent by the Martians in Mars language regarding three questions as how do you wash your hands, how do you brush your teeth, how do you make these activities enjoyable and fun. The aim of the activity is to support children's integration into the narrative, and to inform the children about the context of the design session. To enable translation, a decoding sheet was generated by the researcher (Figure 3.3) including a table matching letters of Mars language with Turkish.
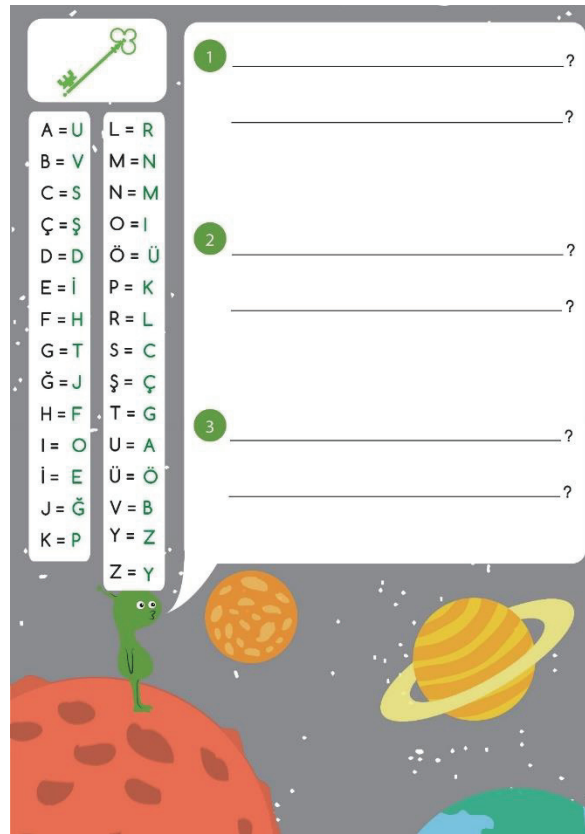
Figure 3.3 Decoding Sheet

3.3.4.2 Developing Activities

In designing the activities, path of expression model which Sanders and Stappers mention in their book Convivial Toolbox (2012) was taken as a base. This model is

utilized for understanding people's past, current and future experiences and each stage of the model addresses one of the three categories of research techniques which are say, do and make (Sanders & Stappers, 2012). Hence, while selecting and staging the techniques, the path of expression enables a pathway (Figure 3.4).
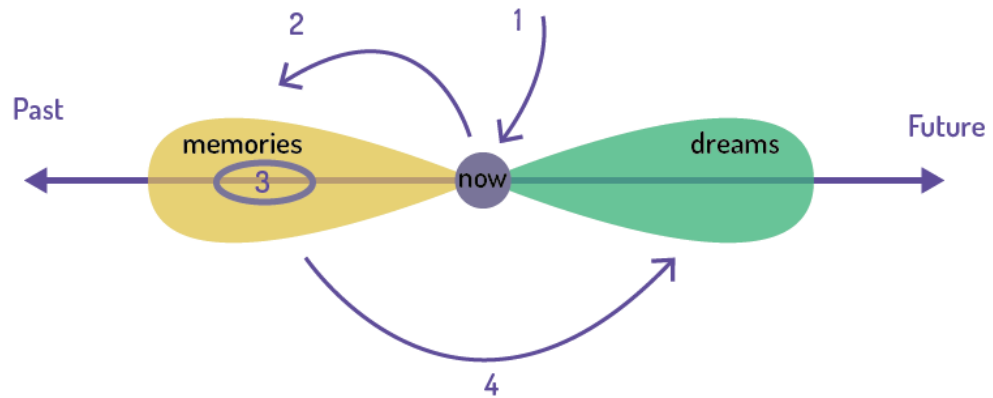
Figure 3.4 The Path of Expression (Adapted from Sanders & Stappers, 2012)

Step one: Exploring the context. As it can be seen in the path of expression, the first step is to observe the current experiences and corresponds with do techniques which are utilized to observe people, their activities, environment and products of these activities. In the context of the project, the students were required to gain insight into the context (school bathroom), the use of products in the context (washbasin, tap etc.) and activities of children (washing hand and brushing teeth). Therefore, the first step was decided to be an observation step in which design teams (children and design students) went to the school bathroom to perform these two main hygiene activities, washing hands and brushing teeth. As a method for the step, *contextual inquiry* was selected. Contextual inquiry combines two techniques which are observation and interview. It focuses on observing actions performed by users while simultaneously discussing these activities with the user through the interview. Observing the user in field gives researcher an insight into current experience of them. Besides, interviewing with the user while they perform activities provides researcher with the understanding of the reason behind the way these activities done. Because of these features,

contextual inquiry method was considered suitable for this step. Based on contextual inquiry, design teams' activities specified as follows:

1. Visiting the school bathroom
2. Children's performing two main hygiene activities
3. Students' conducting interviews with children about these activities.

Concerning the documentation technique, both video recording and photographs were selected, and two students in each team were responsible for documentation. The children were also asked to take photographs of each other while carrying out activities to be later sent to the Martians. The reason behind giving them the role of the photographer was to make the step engaging for children as well as to make them feel like part of the design team.

Step two: Reflection and evaluation. As shown in Figure 3.3, the next step is to recall and reflect on their past memories. This step aims to enable students to gain insight into needs and preferences of children, also to prepare participants for the next generative session. Needs and preferences lie in the deep level of knowledge, so they are difficult to express. Therefore, interview technique was utilized together with question-driven cards (Figure 3.5) generated by the researcher for this step. The first two cards include the first two questions asked by Martians in which children draw and/or write down their actions performed during each hygiene activity step by step with specifying products used to accomplish these actions. The third card includes the third question asked by Martians. In the process of filling the third card, in order to gain information about needs and preferences, a discussion session was included into the step, in which children reflect on these activities and express their way of making low or boring activities more engaging.

Figure 3.5 Question-driven Cards and Envelop

Step three: Ideation. The third step is exploring the future possibilities, in which participants create new ideas and concepts regarding the context. Brainstorming method was considered as suitable for this step, as it has been traditionally utilized to generate ideas or requirements, finding solutions to problems and explore new design spaces. (Wilson, 2013). Moreover, using brainstorming method with children in generative sessions has been proved to enable children to generate novel and creative ideas (Thang et al., 2008). Design students are also accustomed with conducting brainstorming sessions in teams. In order to facilitate brainstorming and to revisit ideas in the next prototyping step, sticky papers were determined to be used to write down or draw ideas.

Step four: Low-tech prototyping. The last step is embodying future ideas and concepts in physical artefacts. Low-tech prototyping technique was considered as the appropriate one for this step since this technique enables children to express their ideas

which are difficult to communicate verbally (Druin, 1999), and to generate ideas or solutions which are more relevant and workable (Thang et. al., 2008). Tools and materials for low-tech prototyping were specified to include paper (white and colored), pencils, crayons, glue, scissors, and play dough. In addition to these, design students were allowed to bring materials they considered useful. Hence, the more diverse the materials are, the more ways children have to express their ideas through (Druin, 1999). Moreover, the students were required to investigate design ideas underlying the artefacts children made because those artefacts cannot express themselves (Thang et al., 2008). Table 3.1 shows the overview of the proposed method.

Table 3.1 Overview of the Method

Phases	Objectives		Techniques	Activities		Location	Materials
	Studio Project	Co-design session		Students	Children		
Warm-up	Integrating children into the narrative	Integrating children into the narrative	Secret decoder	Introducing themselves, their roles and the narrative	Translating signals sent by Martians	School library	Decoding sheet (Figure 3.3)
Exploration of the context	Gaining insights into: - The context of design - The use of existing products in the school bathroom - Users' habits and skills concerning hand hygiene and oral hygiene	Enabling participants to recall their hand and oral hygiene experiences in order to prepare them for the generative session	Contextual inquiry	- Observing - Interviewing with children	- Acting out, performing - Taking photos of their peers	School bathroom	- Mobile phones and cameras - Props (tooth brushes, tooth paste, towel, paper towel)
Reflection	Personalization and customization of products for bathroom context and for personal hygiene	Facilitating children's remembering and reflecting on their past experiences	Interview	- Facilitating children's recalling the actions and products involved in hygiene activities - Probing them to express their needs and preferences	- Writing down/drawing phases of hygiene activities together with the products and accessories involved - Reflecting on the activities and expressing their needs and preferences	School library	Question-Driven Cards (Figure 3.5)
Ideation	Exploring ideas about a dream school bathroom	Enabling children to explore design ideas with no limitation	Brainstorming	Facilitating children's expressing their ideas and thoughts freely	Generating insights and ideas on dream school bathroom	School library	Sticky notes
Low-tech prototyping	Exploring ideas about a dream school bathroom	Enabling children to express their ideas through drawing and physical modeling	Low-fidelity prototyping	- Facilitating children's expressing and visualizing their ideas - Asking children about the ideas underlying the models/mock-ups children make	Generating and modeling ideas about a dream school bathroom	School library	Low-fidelity prototyping tools (paper, crayon, playdough, scissors, glue, etc.)

3.4 Implementing and Evaluating the Method

This section describes the implementation and evaluation of the method. The implementation of the method will be mentioned in the session section including the steps and materials of the session, the participants, the role of researcher and the users in the session, and the outcomes. This part of the section will include photos shooted during the session, but because of the ethical and privacy issues, both students' and children's faces will be covered. The evaluation process will be explained under the post-session interviews section in which the interview schedule and the participants of the interview will also be described.

3.4.1 The Co-design Session: "A Sister School from Mars"

Although the literature review provides a valuable theoretical background for generating the method, it remains inadequate for foreseeing possible outcomes and further developing the method. Therefore, a session utilizing the method was determined to be conducted with the participation of design students and children. The session was integrated into the design studio project aiming to design washbasin and accessories for primary school bathrooms. The participants of the session consisted of 51 junior year industrial design students and 24 3rd grade primary school children (9 years old), and it was conducted in a private primary school.

3.4.1.1 Participants and Spatial Context of the Session

As mentioned earlier the session was integrated into the third-year design studio project and all registered students, 51 in total, were participated in the session. The students divided into 12 groups, three groups of five and nine group of three, for the project.

The number of children participated in the session was 24. All children were in 3rd grade (9 years old), and all of them were from the same classroom. Moreover, besides the researcher, the junior year studio team consisting of two studio tutors, three part-time instructors and one teaching assistant participated in the session as co-facilitators. One teaching assistant could not participate because he was out of the city.

The session was conducted in the library of a private primary school named Ayşeabla Collage (Figure 3.6). With the library as the main location, during the session children and students took a visit to the bathroom for observation. The duration of the session was one and a half hour, from 2 pm till 4 pm.

Figure 3.6 Overview of the Session Place

3.4.1.2 The role of the researcher, design studio tutors and the primary school teachers in the session

The session was conducted in the presence of six members of the studio team, three primary school teachers and the researcher herself. During the process, one of the roles the researcher had was *observer*, that is, *"observer as participant"*. The researcher did not participate in the session activities, but the participants knew the researcher and their being observed by her (Glesne, 2011, p.64). Also, there was some interaction between the participants and the researcher, but it was limited (Byman, 2012, p.443).

As observer, the researcher took notes to facilitate the analysis process. However, observations did not constitute the main source of data (Bryman, 2012, p.443).

The other role of the researcher –and the main role of the tutors and the primary school teachers- was *session facilitator*. As facilitators, the researcher, the tutors helped the students in managing the session properly by assisting them regarding the materials, the activities and the flow of the session, while the primary school teachers monitored the process and assisted the students and children when needed.

3.4.1.3 Co-design Session Stages and Co-design session Materials

The session consists of five stages including three missions to be accomplished:
- Establishing the narrative
- Mission one: Decoding signals from Martians
- Mission two: Exploring the school bathroom
- Mission three: Proposing a dream school bathroom
- Presenting children with the badges of "Interplanetary Design Champion"

Each stage will be described regarding the activities, the materials and methods utilized for these activities, the duration and the documentation of the process. Before explaining the stages, the preparation of student teams for the session will be mentioned.

Getting prepared for the session. In order to conduct the session effectively and to maintain the flow of the stages, the students should be informed properly before the session. Therefore, a brief and a presentation provided by the studio tutors and the researcher including a detailed description of each stage's objectives, activities, materials and duration, along with the list of preparations to be done before the session (Appendix C). Concerning the pre-session preparations, the students went through the following tasks:

- *Roles.* Each team discussed and distributed four roles among its members. These roles included photographer, cameraman, note-taker and partner. The students assigned to the first three roles were responsible for documenting the process. The partner was the one who communicated with the children and facilitated the creativity of children. However, this does not mean that the others in the team did not support the partner; if and when needed they could be both an observer and a facilitator.

- *Badges.* Each student in the design team prepared a badge (Figure 3.7) communicating the nickname associated with their roles and the narrative in order to ease explanation and recognition of their role, and facilitate children's engagement into the narrative. It is important to note that some teams prepared badges for children as well, although they were not required to do so. (Figure 3.8)

Figure 3.7 An example of a Badge Prepared for the Student's Own Use ("Rümeysa, the intergalactic keeper of memories")

Figure 3.8 An Example of a Badge Prepared for Children

- *Equipment and materials.* Each team brought one laptop and at least two cameras or smart phones to take videos and photos. Moreover, they brought low-tech prototyping materials and methods for idea generation including at least paper (white and colored), pencils, crayons, glue, scissors, and play dough. In addition to these, the design students were allowed to bring material they considered useful.

Completing these pre-session preparations and looking through the instructions carefully were of utmost importance in conducting the session properly. Therefore, the tutors and the researcher checked whether the students made the preparations completely.

Establishing the narrative. In the first phase, the narrative and the roles of the students and children were introduced. The narrative to be introduced to children were as follows:

The Martians would like to build a school for children visitors from Earth. However, they have trouble in designing the bathroom for the school because they do not know how children carry out hygiene habits, which products they use and how existing primary school bathrooms look like. Therefore, they contacted METU Industrial Design Department students to help them solve their problems and asked them to consult children on Earth on behalf of Martians. METU students decided to consult the children in Ayşeabla College to find the answers and solutions the Martians sought for.

The role of children, as a part of the design team, was to help the Martians to find solutions to their problem. After they presented the narrative, METU students introduced themselves as mediators and facilitators with specific roles and nicknames written on their badges. Duration of this stage was ten minutes and conducted in the library. After the introduction, the first mission was given.

Mission one: Decoding signals from Martians. In the second stage, the children were shown three videos including signals sent by the Martians in Mars language (Figure 3.9). Then, the students wanted children to help them translating these signals into Turkish individually (Figure 3.10). Each signal addressed one of the three questions listed below:

- How do you wash your hands?
- How do you brush your teeth?
- How do you make these activities enjoyable and fun?

To enable translation, each child was given a decoding sheet including a table matching letters of Mars language with Turkish. With the help of the table, each team went over the questions one by one, and briefly discussed alternative answers.

The main aim of this stage was to engage children in the narrative and their roles. It lasted fifteen to twenty minutes and conducted in the library. The role of the students in this session was to assist children when they needed. After the session finished, METU students proposed children to pay a visit to the school bathroom to make an exploration together.

Figure 3.9 Decoding Phase

Figure 3.10 Decoding Phase

Mission two: Exploring the school bathroom. The third stage is divided into two parts. In the first part, children and design students made an exploration in the school bathroom to inform the Martians. In the bathroom, the children performed two main hygiene activities which the Martians expected to learn how: washing hands and brushing teeth (Figure 3.11, Figure 3.12). Each child was given the role of taking the photos of the other child while s/he was carrying out the activities. This part aimed to gain insights about the context, the activities and activity patterns, the use of the environment and products, and children's skills regarding the hand and oral hygiene. To achieve this, the student teams made discussions with children regarding the two activities during children's performing, and they documented the session by photos, videos and notes.

Figure 3.11 The Child Washing Hands

Figure 3.12 The Child Dry Her Hands

In the second part, the student teams returned back to the library and the children were given three cards. Each card addressed one of the three questions which the Martians asked through the signals (Figure 3.13, Figure 3.14). In the first two cards, children wrote down or drew the stages of each hygiene activity together with the materials and products utilized for these activities. In the third card, the children expressed the low points of the activities with their reasons and how they made them more engaging. After being filled in, the cards were put into a special envelope to be sent to the Martians by METU students. This part of the exploration stage aimed to gain insights into the needs and preferences of children and to prepare children for the next generative session by recalling and reflecting on the past experiences. The role of the student teams was to facilitate children's recalling and reflecting and to document the process. The total duration of the third stage was 45 minutes. After this stage, the children were given the third mission.

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Figure 3.13 Filling the Cards

Figure 3.14 Filling the Cards

Mission three: Imagining a dream school bathroom. In this stage, each team conducted a short brainstorming session with the children and then embodied their ideas into artefacts. In the brainstorming session, the children generated ideas regarding the future products utilized in hygiene activities by using sticky papers to write down and/or draw ideas. Then, the student team provided the children with low-tech prototyping methods so that they could describe, drew and/or model their ideas (Figure 3.15, Figure 3.16). When they were ready, each child took a photograph of his/her work to be sent to the Martians by METU students. This stage aimed to gain insight into the children's wants and dreams. The duration of this stage was 45 minutes. The role of the student teams was to facilitate children's creativity, discuss with the children the artefacts they designed, and to document all the answers and the artefacts carefully. After the generative session ended, the children were given the artefacts they built.

Figure 3.15 The Child Drawing His Ideas

Figure 3.16 Example Material from Idea Generation Phase

Presenting the children with "Design Champion" badges. In the last stage, each child was given a "Design Champion" badge sent by the Martians to thank them for their help (Figure 3.17)

Figure 3.17 The Design Champion Badge

3.4.1.4 The Outcomes of the Co-design Session

The overall resulting co-design session material consisted of the session materials produced and the data collected during the session. The cards filled in by the children in the third phase and the sticky notes utilized during the brainstorming session constituted the session materials. The students gave children the artefacts they made during the prototyping phase at the end of the session after they took the photos of each artefact. Therefore, the photos of the artefacts were the data collected during this phase. The notes taken by the students during this phase provided the description of each artefact and constituted another data set collected during the prototyping phase.

The data collected during the session consisted of the cards and sheets used for fulfilling the missions, videos, photos and notes. The data were intended to be utilized in the following stages of the project including idea generation and evaluation. Materials to be analyzed included decoding sheets and the cards filled in by the children in the third phase. These materials were analyzed team by team in terms of the tools utilized for expression, the way they used and level of completion.

Table 3.2 Analysis of the Materials of the Design Session

Teams	Decoding	Cards			Techniques used by children to fill the cards	Tools used by children to fill the cards
		1st Card	2nd Card	3rd Card		
1	completed	+	+	+	sketching and writing	sticky notes
2	incomplete	+	+	+	writing	sticky notes
3	completed	+	+	+	sketching and writing	
4	completed	+	+	+	sketching and writing	

Table 3.2 Analysis of the Materials of the Design Session (continued)

5	incomplete	-	-	+	sketching and writing	sticky notes
6	partially completed	+	+	+	writing	sticky notes
7	incomplete	+	+	-	sketching and writing	
8	incomplete	+	+	+	sketching and writing	
9	completed	+	+	+	writing	
10	partially completed	+	-	+	sketching and writing	
11	completed	-	-	+	sketching and writing	sticky notes
12	completed	+	+	+	sketching and writing	sticky notes

Decoding sheets. Decoding sheets were analyzed in term of the level of completion Results of the analysis shows that 6 teams (out of 12) completed decoding successfully, but the half of the teams failed in completing the task, as 2 of them partially completed, 4 of them did not able to complete. Partially completed means that one child finish the task, while the other could not and incomplete implies that both children failed to complete the task.

Cards. Cards were analyzed regarding the tools utilized for expression, the way they used and the level of completion. Plus and minus signs in Table 3.2 shows the completion levels of each card. 3 teams failed to complete some of the cards while the others filled them all. All the teams, except one, started to generate ideas in the third card, although it was aimed to understand current preferences of children in terms of making the two main hygiene activities engaging. It shows that the intended use and objectives of the third card were not clear either for students or for children. It also reveals that students collected lack of data about reflections of the children on each

hygiene activity and their preferences. Besides from the third card, the others also were misused by some of the teams. For example, Team 11 utilized all cards for idea generation. In addition to that two teams some card filed by design students. Design students in Team 3 filled all cards by themselves, except the ideas children drew on the third card. In Team 9, design students filled the third card by themselves, while the other two cards were filled by students. All of the findings demonstrate that intended use and objectives of the cards were not clear for students. However, the third cards included children's ideas about future school bathroom reveals that the method facilitate children's idea generation because they filled the whole card with lots of ideas they drew or wrote down.

Table 3.2 shows that, five teams used sticky notes to fill the cards. Moreover, children in most teams preferred both sketching and writing to express their thoughts while children in three teams preferred to just write down. Besides, it is important to note that one team divided all cards into two and each child filled one half of the cards instead of filing them together.

Observations. The students experienced some difficulties during the session. Some of the difficulties they experienced were due to the lack of preparation prior to the session. At the beginning of the session, the researcher discovered that the students had not downloaded the audio files shared earlier with them via Dropbox. Therefore, the audio files were given to the teams via a flash memory device and this caused a delay in the schedule. Secondly, some students were confused about the order of activities, the aim of activities, or the way of conducting the activities. Moreover, some of them told the researcher that this confusion was resulted from the fact that they did not read the session brief in detail. They consulted the researcher and the tutors, which caused interruptions in the schedule.

As mentioned earlier, although they were not required to do so, some teams had prepared badges not for themselves, but also for the children. The researcher observed

that the badges prepared for the children eased the first encounter between the students and the children, and facilitated the children's integration into the narrative and the session.

3.4.2 Post-Session Interviews with Industrial Design Students

In qualitative research, observations are mostly followed by interviews so that participants' perspective to the study could be investigated in depth (Richie, 2003, p.38). A semi-structured interview is one of the major forms of qualitative interviews. This type of interview lies between structured and unstructured interview; it is more flexible than the former and more standardized than the latter (Edwards, 2013). In this type of interview, a list of questions and/or topics to be covered are specified in the form of an interview schedule, but the interviewer can change the order and wording of questions, and may ask additional questions as probes to encourage a respondent to elaborate on an answer (Bryman, 2012, p.471). This method provides the interviewee with the freedom in terms of the way he/she responds while the direction and content are controlled by the researcher.

In this study, the observations made during the session shed light on some aspects of the method which require further improvement. However, these observations need to be enriched and supported by further inquiries. That is why semi-structured interviews with design students who participated in the session were conducted to understand the implications of the proposed method from the students' perspective.

At the beginning of each interview, the participant was given a consent form (Appendix D) which informed the participant regarding the context of the study. Later, the interviewer started by asking a general question about the topic of the study, and gradually continued with more specific questions. During the interviews, the order of the questions was changed, and some additional questions were asked according to the interviewees' answers without digressing from the topic. The interviews were

conducted in METU Industrial Design Department's graduate design studio. The interviews lasted between 10 to 30 minutes and were documented by audio recording.

3.4.2.1 Interview Schedule

In order to structure the interview, an interview schedule was prepared including the questions and possible probes (Appendix E and Appendix F). Before the questions took their final form, two pilot studies were conducted, and after each study, the questions were revisited and revised. In its last form, the interview schedule consisted of 17 questions and divided into six parts:

- Insights gained from the co-design session
- Comparison of the method of observation and the co-design session
- Evaluation of co-design session stages
- Evaluation of idea generation phase
- Evaluation of collaboration during the co-design session
- Suggestions

Firstly, after a brief reminder about the co-design session, the interviewee was asked a general question to engage him/her in the interview and learn his/her general opinion about the session.

> **Q1:** How do you evaluate the session in general?
> > **Q1-P1:** Why do you think so?

The first part aimed to gather information about the insights gained by the students through the session as well as the phases in which and the data through which these insights were gained.

> **Q2:** What are the insights you gained though the session?

Q2A: Which insights have you planned to utilize for idea generation?

    Q2A-P1: Why do you think so?

Before asking Q2B, the session phases and activities were briefly mentioned to help the interviewee recall his/her memories.

Q2B: In which session phase did you gain these insights? Please explain it for each insight.

Before asking Q2C, the interviewer mentioned the documentation techniques utilized in the session to provide interviewee with a pathway.

Q2C: Which data did you utilize in reaching these insights?

    Q2C-P1: (concerning the data they did not use) Why didn't you prefer to use them?

The second part intended to gain insights into the advantages and disadvantages of the session in comparison to the outcomes of observation sessions the students conducted before the session. Before asking the questions, the interviewer reminded the interviewee of the literature review and the user observation phase of the project, and the initial idea generation exercise (the "Matrix" exercise).

Q3: What are the advantages of the session in comparison to the observations you made the literature review and the user observation phase the project?

    Q3-P1: Why do you think so?

Q4: Do you think that the session will contribute to various phases of the design process of this project?

    Q4-P1: (If so) In what aspects do you think it will contribute?

    Q4-P1: Why do you think so?

The third part aimed at gaining insights into how the students evaluated the session phases regarding the students' and children's achievements as well as the difficulties they had during the session.

> **Q5:** What difficulties did <u>you</u> face during the session? Please explain stage by stage.
>> **Q5-P1:** What were the reasons for these difficulties?

> **Q6:** Which steps do you think you successfully conducted?

>> **Q6-P1:** Why do you think so?

> **Q7:** What difficulties did <u>children</u> face during the session? Please explain stage by stage.

>> **Q7-P1:** What were the reasons for these difficulties?

The following questions intended to learn about the aspects of the session which motivated the children and the students.

> **Q8:** Which phases do you think were more engaging for <u>you</u>?
>> **Q10-P1:** Why do you think so?

> **Q9:** Which phases do you think were more engaging for <u>kids</u>?
>> **Q11-P1:** Why do you think so?

> **Q10:** Which phases do you think were less engaging or boring for <u>you</u>?
>> **Q12-P1:** Why do you think so?

> **Q11:** Which stages do you think were less engaging or boring for <u>kids</u>?
>> **Q13-P1:** Why do you think so?

Then, in order to understand how students evaluated the idea generation phase, the following questions were asked in the fourth part.

Q12: What are the experiences you have gained during the idea generation phase of the session?

Q13: What are the creative and interesting observations you made in this phase?

The following questions intended to understand the use and the effectiveness of the materials provided by the students.

Q14: Which materials you provided in this phase was used more effectively by the kids?

> **Q14-P1:** What kind of artefacts these materials were used to create? Why do you think so?
>
> **Q14-P1:** Did they combine the materials? If so, how did they combine these materials?

Later, the following questions were asked.in order to understand how the interviewee evaluated the children's collaboration among themselves and with the student team

Q15: How did the method used in the session affect the collaboration between you and the kids?

> **Q15-P1:** Why do you think so?

Q16: How did the method used in the session affect the collaboration among the kids themselves?

> **Q16-P1:** Why do you think so?

The last question aimed to learn about interviewee's suggestions regarding the session.

Q17: What are your suggestions for improving the session?

3.4.2.2 Participants of the interview

In total, 24 (out of 51) industrial design students, consisting of 15 female and 9 male, participated in the interviews individually. There were two students from each team. The participants were selected based on their roles in the co-design session as there were an equal number of students in each role. The foreign students were excluded from this selection because the students communicated with children in Turkish during the co-design session, and therefore, non-Turkish speaking students were not able to provide detailed information concerning the session. Table 3.3 shows the participants and their roles in the session. The actual team numbers were changed in order to maintain the confidentiality of the participants.

Table 3.3 The Participants and Their Roles in the Co-design session

Team	Participant	Role of the participant	Team	Participant	Role of the participant
Team 1	Student 1	Note-taker	Team 7	Student 13	Note-taker
Team 1	Student 2	Partner	Team 7	Student 14	Photographer
Team 2	Student 3	Photographer	Team 8	Student 15	Cameraman
Team 2	Student 4	Cameraman	Team 8	Student 16	Photographer
Team 3	Student 5	Note-taker	Team 9	Student 17	Photographer
Team 3	Student 6	Cameraman	Team 9	Student 18	Partner
Team 4	Student 7	Photographer	Team 10	Student 19	Partner
Team 4	Student 8	Cameraman	Team 10	Student 20	Note-taker
Team 5	Student 9	Note-taker	Team 11	Student 21	Partner
Team 5	Student 10	Partner	Team 11	Student 22	Cameraman
Team 6	Student 11	Note-taker	Team 12	Student 23	Cameraman
Team 6	Student 12	Photographer	Team 12	Student 24	Note-taker

3.4.2.3 Analysis of the Post-Session Interviews

In the analysis process of the interviews, thematic analysis method was adopted (Auerbach and Silverstein, 2003). This process had iterative features in that existing themes, sub-themes and categories were revised in each phase. As Figure 3.19 shows, analysis process divided into four stages.

Figure 3.18 The Analysis Process
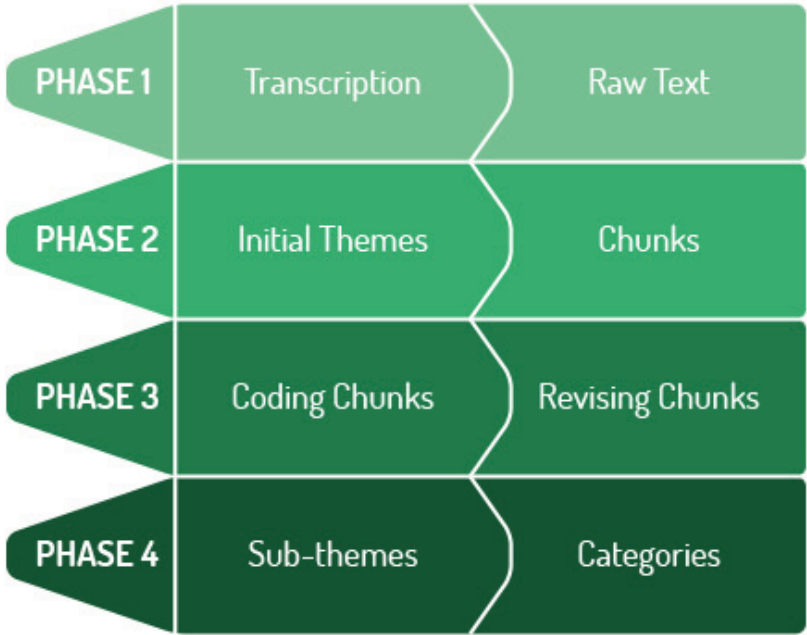
Phase 1. 24 interviews were audio-recorded and verbatim transcribed into MS Word. As Figure 3.20 shows, each interview transcript was assigned a code considering the participant's number and included information of the interviewer, participant, team, date, place and duration of the interview. Transcription process provided the researcher for the overview of and familiarity with the data.

A Sister School from Mars: Co-design Workshop with Children
Interview Transcript

Interview code: 103
Interviewer: Sıla Umulu
Participant: S03
Group: G02
Date: 12.12.2016
Place: Middle East Technical University Faculty of Architecture Room: 35 A
Duration: 00:14:54

103-001. **I: Çalıştayı genel olarak nasıl buldun? Neden?**

103-002. P: Baya eğlenceliydi. Güzel bir gündü.

103-003. **I: Peki faydalı mıydı?**

103-004. P: Yaptığımız projeyi etkiledi baya. Ama bir süre aldı bu. Hemen görülebilir bir fayda sağlamadı. Projeyi ilerletirken kendimizi şunları derken bulduk. Aa deniz de şöyle demişti. Şöyle bir şey istiyordu aslında. Bu fikir ona yakın. Aa selin olsa bu fikri çok beğenirdi gibi.

ÇIKARIMLAR ve İÇGÖRÜLER

103-005. **I: Çalıştay sırasındaki gözlemlerinizden, aldığınız notlardan, edindiğiniz içgörüler /çıkarımlar nelerdi? Bunlardan hangilerini fikir geliştirmede kullanacağınızı düşünüyorsunuz? Neden?**

103-006. P: Daha çok tema belirlerken ilgilerini çeken şeyleri kullanmaya çalıştık.

103-007. **I: Onlar nelerdi?**

103-008. P: Deniz zaten uzayla çok ilgiliydi. Gezegenler muhabbeti falan. Şu an direk gezegen temalı bir şey yapıyoruz.

Figure 3.19 Interview Transcript Example

Phase 2. Audio records were listened again to (in order to avoid possible errors and missing parts) correct possible errors and complete missing parts. During the second visit, some initial themes started to emerge in correspondence with the interview guide.

Phase 3. Transcribed interview data was investigated in the light of the initial themes. Raw data divided into chunks, i.e. relevant texts (Auerbach & Silverstein, 2003), and each chunk was given a number including the interview code and line number of the chunk (Figure 3.21). All texts were colored with grey and the emphasised parts colored with black to be grasped easily. Later, codes were assigned for each chunk considering the initial themes, while grouping the data which was not related to any themes under the *comments.* For example, as a relevant text related to the theme "insights", "One child put her toothbrush on washbasin. She could not assume that the washbasin is not hygienic." was given a code "Hygiene". In the light of the codes and relevant texts, initial themes revised into themes.

Phase 4. All data were copied to MS Excel to easily arrange or cluster the data (Figure 3.21). the After themes were divided into sub-themes and categories. For example, the theme "insights" divided into sub-themes as *insights gained in idea generation phase* and *insights gathered in observation phase*, and the *insights gained in idea generation phase* sub-theme was divided into categories as fun, cooperation, play etc.

Figure 3.20 Coding the Chunks in MS Excel

3.5 Results of the Analysis of the Post-Session Interviews

In this section, the result of the analysis of the interview data will be explained. Each theme will be explained with its sub-themes and categories. Quotations adopted from the interview transcripts were given as examples to support the results. Turkish version of the quotations are displayed in Appendix G.

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3.5.1 Challenges Faced by the Students during the Session

This theme includes challenges students experienced during the session. Challenges will be explained regarding the phases of the session with the reasons behind each.

3.5.1.1 Data Collection

During the session, students had some problems in gathering the data. These problems grouped and investigated under the data gathering phases of the session.

Exploration of the context. The major challenge faced during this phase is that children alter the way they perform the hygiene activities because students were observing them. This situation caused a doubt at observation data's reliability. For example, Student 14 mentioned this situation as follows: "Their behaviour while brushing teeth was more careful because one was watching them. They did not feel free. They asked us what to do." (Q1) Besides from the major problem, some students mentioned that children hesitated and embarrassed to brush their teeth in front of all students and children. This caused deficiency in data gathered during the observation phase. For instance, Student 13 stated that: "… besides our children did not want to brush their teeth. We made one do by force. She came later, so we told her not to do." (Q2)

Reflection and evaluation. There are three major challenges experienced by students during this phase. One of them is that children's competing against each other. The reason behind this competition was that there was one paper for two children, so both of them wanted to be the one who wrote the most. Students had trouble in maintaining a balance between children. To illustrate, one student defined this challenge as follows: "… but as we gave one paper and wanted them to fill, they started to compete against each other. There was a tension between them. In the end, they fight anyway." (Q3)

Besides competition, children got confused on how to use the material, i.e. they oscillated between drawing and writing. According to the students, this situation results from the fact that the size of the papers was too big and children were not restricted to one activity. This caused children's focusing on deciding on what to do rather than the task itself. For example, Student 5 mentioned this problem with following sentences: "Because papers are too big, they could not fill them, as they could not decide whether to write down or to draw." (Q4)

Another challenge regarding data gathering in staging phase is that children could not express activities step by step and the materials utilized for these activities. According to students, this resulted from the fact that questions are too general and this method does not facilitate children to think activities in detail. Student 14 defined this challenge as follows: "Washing hand as an activity was in the child's mind, but she could not think the activity in detail, for example, washing between fingers, washing wrists." (Q5) To overcome this challenge, students used some probs to facilitate children's thinking: "…we helped them. We asked questions like 'what to do next? Taking the soap?' because they hesitated to share their thoughts." (Q6)

Idea generation. This stage is the most challenging one among the others regarding data gathering. Students faced with two main challenges as children's digression from the topic and children's generating extreme ideas. These challenges resulted from the reduction of the efficiency of the phase.

In students' perspective, there is the reason behind children's digression from the topic is that materials took children's attention from the context to play. As most of the children like drawing or playing with playdough, they started to create what they want instead of doing prototypes of their dream bathroom. Some of the students mention that this could be caused by children's getting bored with the session or the topic itself. Student 6 explained this situation as follows:

"Maybe the topic could not take their attention. But if we give children fun things, we cannot take what we want from them. I did not do it too at one time. They draw what is on their mind, you know. She drew a castle. I told let's do a washbasin, but she did not do it. Instead, she made a flying tooth brush. They perceived it as a play and they could get that they should have helped us." (Q7)

The other challenge is that children generate extreme ideas which could not be formed as design solutions. According to students, besides children' nature, this situation could result from the fact that children perceived the prototyping phase as a game and the narrative' fictional features. Student 16 explained the narrative' effect as follows: "Kids started to generate extreme ideas as we talked about Martians. There was a thing like everything could be out of chocolate, we could eat everything." (Q8)

3.5.1.2 Communication

Communication with children was one of the aspects that were found challenges among students. The most stated challenge was that children refrained from students. According to students, this could be resulted from the inefficiency of the warm-up section, being in school and the narrative. Due to the time limitation warm-up session could not be done efficiently so children could not warm with students. This situation, for some teams, affected the whole process. Also, being in school caused children to perceive students as authority, so they hesitated to communicate with students and/or express their ideas. Moreover, students' getting into contact with Martians constitute one of the factors which caused children to refrain from students. Student 13 mentioned this situation as follows: "They thought that we communicated with the Martians, so they saw us as authority. They naturally refrained from us." (Q9)

Besides from children' hesitation, some students found communicating with this age group difficult. Student 6 stated this as follows: "This age group is hard. My mum is a

primary school teacher, and that's why I keep communicating more with children, when I come and go. It is always difficult to communicate with this age group." (Q10)

3.5.1.3 Management

One of the major problems students experienced during the session is regarding time management. Most of the students stated that session duration was not enough to accomplish all the tasks. This situation brings along some problems.

One of these problems is that students could not accomplish decoding phase completely. Some of the students consider decoding as a time-consuming activity because children's handwriting is too slow as they just started to learn how to do it and the duration specified for it was not enough to complete the task. Moreover, tutors' interruption was also stated by some students as a factor increasing the level of stress. For example, Student 2 stated that: "One tutor came and told us to be hurry because we could not complete in time. We thought that we could do, but we became stressful due to not finish on time." (Q11) This situation results from students' helping children by telling the answers or just skipped some parts of the phase. For example, Student 16 mentioned this situation as follows: "… besides we exceeded the time limit. When we were in the second question, one tutor came and told us 'come on, finish now'. That's why we told the answers to the following questions." (Q12)

The other problem resulted from lack of time is that warm up phase cannot be conducted effectively. Most of the students mentioned that as the duration of the warm-up and introduction was not enough; children could not get used to students This stress reduced motivation and concentration of the students.

The other most stated one is difficulties in guiding. This challenge mostly was faced in ideas generation while guiding children' extreme ideas. Students 6 mentioned this

challenge as follows: "It was difficult to direct them. Because when we give them a paper and a pen, it was difficult to direct children to draw a tap." (Q13)

Managing the flow of the session were also considered as challenge by some students. According to them, the reason behind this could be lack of preparation. Besides, Student 11 mentioned tutors as a factor which caused confusion in terms of the flow of steps: "There was a confusion in terms of steps at the beginning. I think tutors also did not know which game we will play next. They came next to us and confused our minds, and then went away."

3.5.1.4 Location

The fact that all teams were located in one room was also a factor that caused a problem. According to students, location resulted in children' and students' lost their attention. Students 19 mentions this situation as follows: "It was a very tight place. It was not nice. We chatted with the others and this distracted by attention. I think that the children also have affected. There was a chaos. We tried to be calm but papers were flying over our head." (Q15)

3.5.2 Contribution of the Method on Co-designing with Children

Besides from the challenges, there are various aspects that support students in co-designing with children. The most stated one was that the session was fun and engaging for students and especially for children. This feature facilitates children's creativity and their integration into the process. Moreover, it makes children express their ideas and collaborate with students willingly and joyfully. One of the aspects that made the co-design session fun and engaging was the narrative; for example, student 19 comments on this issue as follows: "I think it was quite useful. We did not have any other chance to work with children, and the narrative was also fun. I think both the students and the children had fun. It must have been a memorable day for them." (Q16)

Moreover, a shared narrative made children more comfortable and free to share their ideas and thoughts. According to Student 17, the session "was more useful [than the previous user observation phase] because children are usually very shy. They felt more comfortable [in the session] because we had a different approach and the narrative was also fun. They were willing to explain their ideas." (Q17) As a part of the narrative, three students mentioned that children had fun in decoding the signals sent by Martians. For example, Student 8 described how much fun the children in their team had as follows: "… Because they could not help decoding. They began to code both our names and their own names. I think they had a lot of fun there [during that phase], too." (Q18)

According to four students, children's taking photos of each other while enacting hygiene activities in the school bathroom was also an engaging activity for them. Student 6 comments on this phase as follows: "They had fun while they were recording videos of each other in the bathroom. They were dancing. There are very strange videos. Anyway, they had a lot of fun during the video step." (Q19) Moreover, as Student 9 mentions, activity of taking photos also enabled children to get rid of their stress and feel relaxed: "They liked the step in which they took each other's photos. Actually, they started to feel free and relaxed in this step. They were nervous before." (Q20)

According to students the most engaging part for both students and children was idea generation. 18 students out of 24 states that this step was the most engaging one for children and 14 out of 18 mentions that this step is the most engaging one among the others for students. According to students, the reasons behind this was that materials provided in this step made children associate prototyping activity with play. For example, Student 16 mentions this situation as follows, and states that materials boosted their creativity: "… we gave them a lot of colored pencils, we gave them playdough. They did lots of things with them. They cut papers etc. Especially

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playdough part seemed like a game to them. They make first, then broke and then make again." (Q21)

Besides from being engaging, students stated that prototyping activity facilitated expression of their thoughts and ideas. Student 2 mentions this situation as follows: "This step was good. I told you they are not talking too much. But in this step, for example, they started to do something. In that respect, it was good... children's doing something themselves without talking to us." (Q22) Moreover, prototyping activity enabled children to generate more detailed ideas as Student 2 mentioned: "I think this time they add details. For example, they add patterns or they add some features to their designs." (Q23) Furthermore, according to two students in prototyping phase they started to create connections between bathroom environment and their ideas. Student 19 illustrated this situation as follows: "They started to create connections between their ideas and the bathroom environment. They made a toilet plan at first, then they place their design on that plan." (Q24)

3.5.3 Contribution of the Method on the Early Phases of Design Process

This section presents contributions of the method on the early phases of the design process in terms of students' perspective, and insights generated by the students during idea generation and exploration of the context phases of the design session. According to design students the method supported the early phases of the design process regarding:

- Observing children in the context
- Developing understanding about user
- Justifying design decisions

3.5.3.1 Observing Children in the Context

The most stated achievement or advantage of the session is observing children in the context. moreover, observation phase found the most fruitful phase in terms of data

collection. In observation phase, students gained insight into hygiene requirements and habits. Student 10 illustrated this point as: "I did not take into account [the observational research we made] when we went [children's home]. Since the important thing is to observe them in school environment. We observed children in the use context [during the session]" (Q25) Moreover, according to students observational research they made before the session in the school environment was insufficient because of the privacy issues primary schools take into consider and other factors such as children's not perform brushing teeth in schools. Student 7 pointed out how privacy issues effect observation in schools as follows: "They do not let you to communicate with children, also you cannot take children's photos, you cannot talk to them. Because of this, we talked only with teachers and janitors, instead of children. In contrast, we had a chance to communicate with children in the session." (Q26) Moreover, Student 15 drew attention to the second point and mentioned how the session enable them to observe the activity of brushing teeth in school environment:

> "It was beneficial to be at school, also we mostly observed only bathroom environment in observation we made in school. We did not observe children's use of the products in the environment because they do not brush teeth in school, so it was beneficial for us to observe how children perform the habit of brushing teeth in school bathroom." (Q27)

3.5.3.2 Developing Understanding about User

The second most stated one is developing understanding about user in terms of preferences and dreams. This achievement was mostly gained in idea generation phase. For example, according to Student 2 the session was useful in terms of "understanding children. we could not spend time with children in there [in the previous observation phase]. We had short conversations with them and they just said few things." (Q28) Furthermore, student 10 mentioned support of the session in developing an understanding about children and in changing perspective in term of children as follows:

"In order to design products for children, one should spend time with them. For example, my perception of children was very different [before the session]. For example, I had a chance to understand that they do not have such skills. I thought that they were very stupid." (Q29)

3.5.3.3 Justifying Design Decisions

According to two students, the co-design session enabled them to justify their design solutions in studio critics or in preliminary jury. Student 22 illustrated this point as follows: "… also you can use the session findings as a proof when talking to the studio tutors. If they ask why you did this like that, we could tell them that we did this according to findings we gained through the session." (Q30)

3.5.3.4 Insights Generated by Students

This section presents the insights gained by design students from observations made during the exploring the school bathroom phase and from the data gathered the brainstorming and low-tech prototyping phase.

Exploring the school bathroom. According to students the most fruitful phase of the session is the exploration of the school bathroom in terms of gaining insights. Table 3.4 shows observations made by students in this phase and insights generated by them based on their observations. These observations and insights are described team by team. The first column of the table demonstrates design considerations identified by the researcher which are based on the considerations of the project and literature review and related to quotes stated by the students in the interviews. The second column displays the observations made by students and includes interview quotations summarized by the researcher. The final column shows design insights generated by design students from their observations and it also includes the summary of quotations stated by design students in the interview.

Table 3.4 Design Insights Generated by Design Students from Their Observations

	Design considerations identified by the researcher	Observations made by design students	Design insights generated by design students
Team 2	- Hygiene - Storage	Children put they toothbrushes into their pockets or in nylon bags, and they put them on the washbasin after they use it!	Children need a box to put they toothbrushes and pastes, and a place to store the box.
	Resource efficiency	Children forgot to turn off the tap after they finished washing their hands.	Children should be encouraged to save water.
Team 3	Storage	Children did not have a place to put their toothbrushes and pastes.	Children need a place to put their toothbrushes on or in.
	Safety	The bathroom floor was wet.	There should be a protective measure around the washbasin.
	User characteristics	There was too much height difference among the children at the same age.	Product should be suitable for children of different heights.
	- User characteristics - Affective features	Children sought for fun in every activity they did.	Product should be fun and engaging.
Team 4	Hygiene	One child put her toothbrush on the washbasin!	Children did not care much about hygiene.
	User characteristics	Some children delayed returning to the classroom after the break.	It is better if there is no need to leave the classroom to wash hands.
Team 5	Hygiene	One child dropped her toothbrush and did not care!	Children do not care much about hygiene.
	User skills	One child could not hold the toothbrush properly and dropped it off!	Children cannot use their hands as well as adults do.
	- Safety - Ruggedness	Children were very naughty and inclined to damage products and hurt themselves.	There should be a protection area around the washbasin.
Team 6	User characteristics	-Children delayed washing their hands and brushing their teeth.	Children are lazy about washing their hands and brushing their teeth.

Table 3.4 Design Insights Generated by Design Students from Their Observations
(continued)

Team 6	Hygiene	- Children put their toothbrushes on the washbasin. - One child put her toothbrush in pencil case without a cap.	Children needed a place to store their toothbrushes and pastes.
	User characteristics	Children did not wash their hands in proper time and in a proper way.	
	Location of the products	One child forgot to show how to dry her hands.	Tissue dispenser was placed too far from washbasin
	User characteristics	Children could not perform the activities properly.	Children did lots of mistake when their minds were occupied by another thing.
	Number of items	There were one tissue dispenser and one trash and it created a kaos	Product should prevent this kaos resulting from lack of items
Team 7	User characteristics	Children performed activities properly.	Children knew how to perform hygiene activities properly and feel enthusiasm to perform them.
	Usability	Children had problem with sensors on the tap.	Sensors should be placed properly
Team 8	Hygiene	Children put their mount on tap to rinse.	Children did not care about hygiene and use products in a wrong way.
	User characteristics	Children did not spend enough time for hygiene habits.	Product should encourage them to perform hygiene habits in proper time.
	Hygiene	Children carried their toothbrushes in nylon bags.	Children needed a place to put toothbrush and paste.
	Usability	Children tended to hit sensors because they thought that it did not work.	The tap should be manual.
	Resource efficiency	One child forgot to turn off the tap.	Children tended to leave the tap open

Table 3.4 Design Insights Generated by Design Students from Their Observations
(continued)

Team 9	Hygiene	Children put their toothbrushes on washbasin.	Children needed a place to put toothbrush and paste.
	Usability	- Children had difficulties in brushing teeth because of sensors. - Children had difficulties in activating the sensor.	Sensors should be placed properly
	Places of items	One child forgot to show how to dry her hands because tissue dispenser was placed too far from washbasin.	Tissue dispenser should be placed properly.
	Resource efficiency	One child forgot to turn off the tap.	Children are not aware of how much water they consume.
Team 10	Storage	One child could not find a place to put his towel.	Children need a place to store the box.
	Usability	Children had difficulties in activating the sensor.	The tap should be manual.
	User characteristics	Children did not know how to brush their teeth properly.	Product should guide children to make them brush their teeth properly.
Team 11	Hygiene	Children put their toothbrushes on the radiator.	Children did not care much about hygiene.
	User characteristics	One child brushed his teeth faster because the water was too cold.	Time spent for brushing teeth changes depending on the temperature of water.
	User characteristics	Children did not know how to brush their teeth properly.	Product should guide children to make them brush their teeth properly.
Team 12	Environment features	The bathroom doors were too short for adults to go in.	Teachers and janitors may have difficulties in entering the bathroom.

Brainstorming and low-tech prototyping. In this phase, design students gained various insights based on children's ideas and thoughts. Table 3.5 shows ideas and thoughts of children and insights generated by design students based on them, and these are grouped under the teams in the table. As in the Table 3.4, the first column presents design considerations identified by the researcher based on quotes students stated in

the interviews. The second column demonstrates the summary made by researcher based on children's ideas and thoughts mentioned by design students in the interview. The final column shows design insights which students generate from children's thoughts and ideas.

Table 3.5 Design Insights Generated by Design Students Based on Children's Thoughts and Ideas

	Design considerations identified by the researcher	Children's ideas and thoughts	Design insights generated by design students
Team 1	- Affective features - User characteristic	Children wanted slides through the toilets, jumping washbasins and flying toilets.	Moving objects attract children's attention.
Team 2	Usage features	Children wanted toothbrushes to include toothpaste in it.	- Children want to do lots of things with one product. - Product can be multifunctional.
	Product concept	One child wanted to see planets and space in the bathroom.	Concept of the product family may relate to space.
	Resource efficiency	One child wanted to see fishes in the toilet.	Fishes can be used to encourage water-saving.
Team 3	-	-	-
Team 4	Affective features User characteristic	Children wanted to wash their hands together and make water fight with each other.	Product should be enable children to wash their hands together.
	Affective features User characteristic	Children wanted to play and turn every activity into a game.	Product may enable them to play.
Team 5	Affective features User characteristic	- Children wanted balls in the bathroom and preferred colorful and playful products. - Colorful and playful	Only thing children cared about and seek for is fun.
Team 6	Affective features User characteristic	- One child preferred to use soap dispenser shaped like a ladybug. - Children wanted to see themselves as a monster or a Martian in the mirror.	Figures attract children's attention. Children preferred to use products with figures they like.

Table 3.5 Design Insights Generated by Design Students Based on Children's Thoughts and Ideas (continued)

Team 6	Affective features User characteristic	Children preferred colorful and playful products.	Children wants to turn hygiene activities into play because they got bored. Products should be playful.
Team 7	Usability	Children generated ideas in terms of usability of the washbasin.	Children cares also about usability, instead of just cares about fun.
Team 8	User characteristic Preferences	One child wanted the number of washbasins and toilets to be equal.	Children does not want to wait for washing their hands
	Affective features User characteristic	Children drew the bathroom as a soccer field, placed dustbin near the door to throw his trash into it as playing basketball.	Children wants to turn hygiene activities into play.
Team 9	Affective features	One child wanted color changing water.	Mirror may change color.
	Affective features User characteristic	Children wanted to see themselves as a monster or a Martian in the mirror	Children preferred to use products with figures they like.
Team 10	Safety	One child wanted the toilet door not to close or to be opened easily.	Children may be afraid of being locked in the toilet.
	Affective features User characteristic	One child wanted silvery water flowing from the tap.	Children likes colorful and engaging products.
Team 11	-	-	-
Team 12	Affective features	Children wanted to place colorful lights in the bathroom.	Lights can be used to guide children in the bathroom.
	User characteristic	Children wanted to turn hygiene activities into play.	Children got bored while performing hygiene activities.

3.6 Limitations of the Study

The co-design session was conducted as an in-class activity at the school premises, and the duration of the session was limited to two hours. The location of the session had been decided by the school headmaster, and except one activity conducted at the

school bathroom, the co-design session took place in a single large room, the school library. This caused a crowded and noisy atmosphere during the session due to the large number of participants, and resulted in children's, as well as students', losing their attention.

During the co-design session, the researcher had to play both the role of a facilitator and of an observer, which, time to time, limited the researcher's observations to a particular team. Furthermore, the number of participants (51 students, 24 children) was very high, and it was challenging for the researcher to observe each and every team.

Since, the design and implementation of the co-design session had to be done synchronously with the studio project, there was strict deadlines. Therefore, it was not possible to test the tasks and materials of the co-design session beforehand.

The session was conducted five weeks before the semester break, and during these five weeks, the students were so busy with the project and the other courses that it was difficult to arrange and conduct the post-session interviews. Therefore, four students (out of 24) were interviewed after the semester break. This caused students' experiencing difficulties in remembering the details of the process and the session, and the collected data were limited in comparison to those collected in the former interviews.

In this study, the researcher's main focus was developing a co-design method for design students' own use. Nevertheless, conducting interviews with school teachers and tutors would have provided valuable insights and recommendations for further developing the co-design method for design education. Due to time limitations, it was not possible to conduct interviews with all stakeholders, and the researcher had to limit the parties interviewed.

CHAPTER 4

CONCLUSION

4.1 Revisiting Research Questions

This study aimed at finding the answer to the following main question: How can a co-design method be developed for the early phases of the design process to support industrial design students for eliciting children's needs and preferences?

In the process of seeking the answers, firstly, a literature review was conducted. The literature review provided a significant background about co-design approach and its implications for design research with children and industrial design education. Moreover, the review of literature of co-design with children provided to investigate existing methods, tools and techniques developed for designing with this special user group and case studies utilized them. With the light of this background, each method and technique were analyzed in terms of various dimensions and presented as method matrix. Along with the information provided by the method matrix, proposed co-design method was generated and applied in a session which was integrated into a junior industrial design studio to investigate outcomes of its practical implications. After the session, post-session interviews were conducted with design students to gather their insights into the session and its outcomes. Observations made during the session and interviews constituted the main data to answer the main question. In addition to that, the researcher participated in the final jury to investigate how and in which ways the outcomes of the session affected the final design solutions.

In this section, an overview of the results of the study will be explained together with the answers given to the following sub-questions:

- What are the existing methods and tools developed for co-designing with children?
- How can these methods and tools be reinterpreted for developing a method to support industrial design students for co-designing with children?
- What is the potential of the method developed to support industrial design students for co-designing with children?
- What is the potential of the method developed to support the early phases of the design process for eliciting children's needs and preferences?

What are the existing methods and tools developed for co-designing with children? The answer to this question sought in the literature. There is a huge repertoire of the methods and tools developed for co-designing with children in the literature. Most of these methods and case studies utilised them based on human computer interaction field, as the notion of 'children as design partners' was emerged from Allison Druin's studies in child computer interaction (Druin,1999). Therefore, it is rare to encounter with researchers including techniques developed for traditional product design. Moreover, in the literature, there are no attempts to develop a tool or a guideline for facilitating co-creativity of children and industrial design students. There are few examples of integrating children in co-design sessions in the context of design education, but these researchers are based on an evaluation of the outcomes of co-design sessions with children in students' perspective. However, as design students are novice designers who have not yet develop some skills that professional designers have and working with children as design partners need specific skills, existing techniques for co-design with children required to adapt concerning novice designers' skills. Therefore, a literature review on existing techniques enables the researcher to find this gap and the need of developing a co-design method to facilitate students in co-design with children.

Besides from revealing these gaps, literature review provided an investigation of existing methods and its implications. In this study, these methods and techniques are grouped based on Nousiainen (2008). Nousiainen divides methods into five, based on the way by which researchers gain information from children, as observation-based methods, narrative-based methods, documentation-based methods, art-based methods, and game based methods. *Observation-based methods* aim at gaining an understanding of the users' actual work environment and their needs by observing and interviewing them while they are doing everyday activities. Contextual inquiry (Druin,1999) method is the most used and mentioned method in this classification. *Narrative-based methods*' intended aim is to facilitate expression and verbalization of the views and ideas of children and include Embodied Narratives (Giaccardi et al., 2012) and Mission from Mars (Dindler et al.,2005). *Documentation-based methods* aim to discover different aspects of the topic area and to gain information about the context by utilizing documentation techniques, and include Kid Reporter (Bekker et al., 2003) and Networking News (Nørregaard et al., 2003). *Art-based methods* intend to enable children to materialize their ideas and generate solutions based on hands-on activities including mock-up and low-tech prototypes. This category includes Comicboarding (Morajevi et al., 2007), Mixing ideas (Druin et al., 2004) and Layered Elaboration (Walsh et al., 2010) methods each of which derived from cooperative inquiry (Druin, 1999).

After the methods were investigated, each method was analyzed in terms of the main purpose of the method/technique, the activities included, the age of the participants, the skills required, the design field in which these methods and techniques were utilized, and pros and cons of its implication. This analysis was presented as a form of a methods matrix. The matrix provided an important reference for developing the method.

Development of the proposed method and implementation and post-implementation process of the method will be explained in the following section.

How can these methods and tools be reinterpreted for developing a method to support industrial design students for co-designing with children? The answers to the second sub-question was found in literature and field study. The development of the proposed method was done in the light of literature review. Section 3.3 explains the process of development and proposed method in detail. The results of the field study were explained in the following sections.

What is the potential of the method developed to support industrial design students for co-designing with children? Most of the students found the proposed method supportive in co-design with children, besides several challenges students faced during the session in terms of data collection, communication, management and location. There are several aspects of the session which support design students in co-designing with children. The most stated one is that the session is fun for both children and students, but especially for children. This feature facilitated children' creativity and integration of the process. Moreover, it makes children express their ideas and collaborate with students willingly and in a fun way. Taking photos, prototyping and the narrative itself were the activities stated by students which made the session engaging. Besides from being engaging and fun, each activity supported design students' co-designing with children in terms of various aspects.

Narrative. According to the field study, narrative created a common ground for children and students by making all members of the team as a part of one shared mission. This finding shows that the researcher's purpose behind utilizing a shared narrative was achieved, which was mentioned in section 3.3.4. Moreover, it also corresponds with arguments made by Dindler et al. (2005) in terms of the benefits of utilizing a shared narrative space in co-designing with children, which was mentioned in literature review under section 2.3.2.

Taking photos. Activity of taking photos was one of the most engaging activity for children according the students. This issue is also mentioned by Giaccardi et al. (2012)

and Bekker et al. (2003) as an achievement of the methods they applied in their case studies, which was discussed in the literature review under section 2.3. Moreover, this activity enabled some children who were shy and refrained from students to warm to students and fully integrate in design session.

Prototyping. According to interview findings, prototyping enables children to express their ideas which are difficult to communicate verbally and use their creativity. Most of the students stated that when they started the prototyping session and gave materials to the children, they came out of their shell and started to generate ideas. Moreover, it enabled children to create more concrete and detailed ideas as well as to create connection between spatial context and product. This finding corresponds to Druin's (1999) and Thang et al.'s (2008) arguments which was mentioned in section 3.3.4 as one of the aims utilizing low-tech prototyping in proposed co-design method.

What is the potential of the method developed to support the early phases of the design process for eliciting children's needs and preferences? This question was answered by the results of the field study and supported by the participation in the final jury. During the session design, students gained insights into children's needs, preferences and dreams. Moreover, the session provides students for developing some skills in terms of design research and process. The session was found fruitful by most of the students.

The most fruitful phase of the session in terms of data collection was stated as observation by 13 students out of 24, and 15 students found the session fruitful in terms of observing children in the context. With the help of this phase, students found a way to observe children in the context and address the problems and needs of children. In the research phase of the project conducted by students before the session, most of the students did not feel able to communicate with and observe children because primary schools did not let them do due to the safety issues. In the session, students found a chance to communicate as well as observe children and most of them utilized these

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data in specifying the requirements of the projects, according to observation in the final jury.

Developing an understanding about the user is the other achievement students gained. This was provided by idea generation and prototyping phase by which students gained insights about preferences and dreams. These insights included: products should be fun, playful and colorful, included figures or cartoon characters and enable to do the activities together. However, observations made during the jury shows that students failed to integrate these findings into the design solutions.

Besides from benefits of the session on the project process, students stated that the session has long-term benefits in design research skills. It is important to note that students participated in the session did not have any experience in terms of co-design with children. Along with the session, students gained experiences in communicating and designing with children as design partners. Some of them mentioned that the session results in changing of their thoughts about children in a positive way.

The long-term benefits of the method cannot be seen and evaluated right now, but the benefits of the method on the project process were clearly seen in the interviews and especially in the final jury. The result is that most of the students failed to analyse the data gathered in the session and integrate their insights into the proposed design solutions.

4.2 Implications of the Study for Further Developing the Method

Proposed co-design method has been developed for supporting design students' eliciting children's needs and preferences. Therefore, it is important to note that in this study the method was implemented by novice designers who had not yet developed professional skills fully. Moreover, they did not have previous experience in participating in and facilitating co-design sessions with children. While developing the

method these issues were taken into consideration, however, since the study focused on developing the method and the co-design session itself, the pre-session and post-session processes were not the most central consideration. Nevertheless, the main insight gained through the study is that the co-design process should be taken as a whole and include the pre-session and post-session processes as well. In order to achieve the intended aim of the method and the co-design session, it is necessary to specify the roles and responsibilities of all the actors and stakeholders involved for all the phases. Therefore, the following sections discuss the implications of the study for further developing the method under pre-session, co-design session and post-session processes. Table 4.1 summarizes the recommendations for further developing the method together with the objectives and the findings of the study.

Table 4.1 The Recommendations for Further Developing the Method

Phases of the proposed method	Objectives		Field Study Findings		Recommendations
	Studio project	Co-design session	Challenges	Achievements	
Warm-up	Integrating children into the narrative	Integrate children into the narrative	- Decoding took too much time (children's hand writing was too slow, they had difficulties in understanding the decoding process) - Duration for warm-up was too short	- Narrative was engaging and playful. - Narrative created a common ground for children and students.	- Duration for warm-up can be increased and turned into a game. - For example, decoding can be turned into a matching activity in which writing is not dominant.
Exploration of the context	Gaining insights into: - The context of design - The use of existing products in the school bathroom - Users' habits and skills concerning hand hygiene and oral hygiene	Enabling participants to recall their hand and oral hygiene experiences in order to prepare them for the generative session	- Being observed by adults made children change the way they perform the hygiene activities. - Brushing teeth in the presence of adults caused hesitation because it was perceived as a private activity.	- Taking photos was an engaging activity for children. - It enabled students to gain insights into the context and children's needs. - Students effectively utilized the videos and photos taken during the session in the later phases of the design process. - It was described as the most helpful step by the students.	- The number of cameras/eyes can be decreased. Children may take the role of researcher and take videos of each other. Students can observe, ask questions and take notes.
Reflection and evaluation	Gaining insights into personalization and customization of products for bathroom context and for personal hygiene	Facilitating participants in remembering and reflecting on their past experiences	- The intended use and objectives of the cards were not clear either for students or for children. - One card for multiple participants created competition for some teams.	In one team children were able to express their personal experiences and preferences	- A pilot study can be conducted by the researcher in consultation with teachers. - This phase can be altered or simplified. For example, each child can create a poster by using visual materials provided by students, and children can present their posters and make a group discussion with the help of students.
Ideation	Exploring ideas about a dream school bathroom	Enabling children to explore design ideas with no limitation	- Students had difficulties in managing the time and process. - There was a mismatch between students' expectations and the ideas expressed by children.	- It gave freedom to children while generating ideas and resulted in a high number of ideas. - The ideas generated by children were not 'ready to use'. They required further evaluation and reinterpretation before they were incorporated into the design solutions.	- The students need to be informed before the co-design session about the expected outcomes. - The students need to be encouraged to discuss ideas developed in co-design session, to identify design insights, share them, and to translate them into design ideas.
Low-tech prototyping	Exploring ideas about a dream school bathroom	Enabling children to express their ideas through drawing and physical modeling	- Materials took children's attention from the focus of the session. - Students had difficulties in guiding children.and managing the process.	- Materials were engaging and playful. - It enabled children to create more concrete and detailed ideas and to create connection between spatial context and product. - It enabled children to express their ideas which are difficult to communicate verbally	- Pre-workshop information/lesson - Post-workshop analysis session

4.2.1 Pre-session Process

According to the field study, design students had difficulties in managing the session process and collecting the data during the session. There are three major issues which caused these challenges. Firstly, as most of the design students did not experience generative sessions with children, they did not know how to gather data during co-design sessions with children, how to prob children, how to properly document sessions, and how to communicate with children properly. Secondly, as mentioned in section 3.5.1.1, according the students the most difficult phase was the idea generation in terms of data collection because of the fact that children generated extreme and irrelevant ideas. However, according to the researcher these challenges regarding data collection resulted from the fact that in there was a mismatch between students' expectations and the ideas expressed by children. In other words, students expected a direct contribution from children, ideas which can be directly applied to the design solution, instead of considering children's ideas as resources for insights. However, since children have not experienced a design process before and they were asked for express their dreams, they were not able to give such kind of a contribution. some of them did not prepare properly before the co-design session. Finally, as mentioned in section 3.4.1.4, some students told the researcher that they did not even read the session brief in detail. This caused challenges in managing the session process. According to the researcher, all of the three issues which caused challenges in terms of managing the session process and collecting the data during the session shows that in order to fulfill the aim of the co-design session, before the session, students required to be informed about :

- how to gather data during co-design sessions with children, how to prop children, how to properly document sessions, and how to communicate with children properly
- the expected outcomes of the session

- the order of activities, the aim of activities, and the way of conducting the activities

Another issue reveals the results of the field study was that children had difficulties in terms of using the materials utilized especially in decoding and reflection and evaluation phase. As stated in the limitation of the study section (section 3.7), the materials utilized in the session could not be tested before the session. The results of the field study reveal that it can be beneficial to conduct a pilot study in avoiding the drawbacks on conducting the session or fulfilling the objectives. Moreover, consulting teachers in terms of suitability of the tasks for children's skills can also be helpful in selecting the materials.

4.2.2 The Co-design Session

As students mentioned in the interviews, they experienced several challenges in each step, and they made suggestions to overcome these challenges. Firstly, the warm-up phase was found inefficient in terms of students and children' warming up with each other. In some cases, it affected the whole process because children refrained from students and were not feel free to express their thoughts and were afraid of telling the wrong answer. Therefore, the warm-up session required to be improved and the duration of it needed to be extended in order to avoid hesitations in terms of expression of ideas. According to students' suggestions to overcome this problem, the warm-up can be conducted as a game concerning the topics which children are interested in.

Secondly, decoding found the most boring phase of the session by students, as it was time-consuming due to the slowness of children' hand writing and there was zero contribution of the design students. Moreover, the audio materials could not be heard and understand by the children due to too much noise in the room. In order to avoid these problems, as one student mentions, decoding and the Martian language can include visual elements such as symbols and children can be asked to match these

symbols with our alphabet to find what signals say instead of writing all the signals and its translations. In this way, it can be an engaging activity for both children and design students.

Thirdly, in exploring the context phase, being observed by adults made some children change the way they perform the hygiene activities. This caused design students' doubt about the reliability of the data collected by them during the phase. Moreover, some of the children hesitated to brush their teeth in the presence of adults because they perceived it as a private activity so some teams were gathered less data comparing to the others. In order to eliminate these problems, the number of cameras/eyes on children can be decreased. It can be fruitful to give children the role of researcher and let them take videos of each other while students observe, ask questions and take notes.

Fourthly, in reflection and evaluation phase, students had difficulties in gaining information from children, as the method did not facilitate children' expression of the two main hygiene activities in detail, and one card for multiple participants created competition for some teams. Moreover, analysis of the materials of this phase and post-session interview findings showed that the intended use and objectives of the cards were not clear either for students or for children. In order to overcome these problems, this phase can be altered or simplified. For example, each child can create a poster by using visual materials provided by students, and children can present their posters and make a group discussion with the help of students. It can be effective and easy to do activity for children thus students can collect more useful data about their habits and preferences.

Finally, idea generation was considered as the most challenging phase by the students. Guiding children while they were generating extreme ideas was really hard for them. Moreover, most of the students had difficulties in evaluating and selecting the ideas.

Solution to this problem can be solved by providing information for students about how to guide children, how to evaluate ideas and develop them into design solutions.

4.2.3 Post-session Process

According to the results of the study, most of the students failed to analyze the data gathered in the session and integrate their insights into the proposed design solutions. This is because, students were not given any guideline or directions for the analysis. Moreover, after the session, students were not provided with a platform or task for discussing and sharing their insight and experiences with each other. Post-session discussions can provide rich insight source for students. It can be conducted as a one-day task or a session in the context of the studio class in which students will be guided by tutors, and the researcher in analyzing the data and at the end of the analysis students will present the results to the others.

4.3 Recommendations for Further Research

This study focused on development and implementation of a method for facilitating design students' eliciting children' needs and wants. In developing the method, design students' skills as novice designers were taken into consideration and investigation of their insights into the implementation of the method was found necessary.

Due to the time limitations, interviews were conducted only with design students. In addition to that, interviews with studio tutors would provide expert opinion about the implementation of the method in the context of design education. Moreover, interviews conducted with teachers would enrich the results by providing an expert opinion in the context of children' involvement into the co-design session with students. Furthermore, asking for children' opinion also would provide insights into the implications of the method according to children' perspective.

The session included the active participation of students and children with the other stakeholders being facilitators. The active involvement of teachers into the design sessions would be helpful for design students in managing the process and facilitating children' creativity and involvement.

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PROJECT BRIEF

Middle East Technical University Faculty of Architecture Department of Industrial Design Fall 2016-17 ID 301 Industrial Design III

Asst. Prof. Dr. Harun Kaygan, Asst. Prof. Dr. Fatma Korkut, Part-time Inst. Dr. Senem Turhan, Part-time Inst. Funda Özkan, Part-time Inst. Tuğba Ülker, Res. Asst. Itır Güngör Boncukçu, Res. Asst. Mert Kulaksız

14 November 2016

Sustainable Hygiene
Washbasin and accessories for primary schools in collaboration with Kale Group

Educational settings are where long-lasting and sustainable hygiene habits and related skills are developed, including regular hand washing, correct use of soap, dental hygiene, and keeping and maintaining personal hygiene products such as a toothbrush, toothpaste, a soap, and a towel.

This is a scenario-based product family development project for primary school bathrooms. The primary scenario involves small groups of primary school children (6 to 10 years old) washing their hands and brushing their teeth after lunch. The outcomes of the project will include the design of the washbasin and of all accessories related to the scenario such as the tap, holders for tooth-brush, soap and towel as well as personal bags to be used by children. The project will explore the following approaches for the design process:

- Enabling and engaging design: Developing design solutions which leverage kids' habits and skills concerning hand hygiene and oral hygiene in particular; engaging interactions which encourage the development of long-lasting healthy hygiene habits at school; promoting product value, meaning and longevity through personalization.

- Participatory design: Incorporating target users and stakeholders into the early phases of design process; co-developing ideas, visions and dreams with the involvement of kids and stakeholders; collaborative idea generation.

- Resource efficiency: Developing design solutions which promote changes in user behavior and usage patterns in line with responsible consumption patterns; conserving water and reducing waste (e.g. reducing the use of paper towels) in school bathrooms.

- Post-use, maintenance and cleaning: Developing design solutions which enable outdated or worn-out systems or parts to be refurbished, replaced or renewed both aesthetically

and technically (e.g. adding new functions, offering optional design features such as color and graphic applications); materials and design details which enable easy cleaning.

- Product safety and accessibility of the products for children's use.

Target user group and stakeholders: Primary school children (6 to10 years old), teachers, school administrators, and school personnel responsible from maintenance and cleaning of the school bathrooms.

Project Phases

1. Literature search, user observations and project dimensions: Before starting to develop design solutions, you will review the existing literature to gather knowledge and insights about primary and secondary users, manufacturing processes and materials, and the local and global markets. You will also conduct interviews and observations at homes and schools to understand the user and the context. You will analyze the visual and verbal data from this phase, and based on the major conclusions you reached you will develop project dimensions.

2. Initial design exploration through collaborative research and participatory design: Through collaborative research tools and participatory design workshops, you are going to reinterpret and reframe the project context, and develop your initial ideas together with school children.

3. Developing alternative design solutions and product lifespan scenarios: Based on the previous phases, you are going to develop alternative design solutions together with full scale mock-ups, further develop them through product lifespan scenarios, and detail those scenarios into product families.

4. Final design and evaluation: The teams will set up an exhibition collectively, present their finalized product family design together with product lifespan scenarios and full scale white models, and receive feedback from the tutors and the stakeholders.

Assessment

Teamwork (80%)
  Literature search and user observations 15%
  Preliminary evaluation (incl. idea generation and workshops) 25%
  Final jury (including final screening) 40%

Individual work (20%)
  Individual submissions 10%
  Team attendance and participation 10%

APPENDIX B

PROJECT CALENDAR

METU DEPARTMENT OF INDUSTRIAL DESIGN 2016-17 FALL		ID 301 INDUSTRIAL DESIGN III-PROJECT CALENDAR				
Sustainable Hygiene: Washbasin and Accessories for Primary Schools in Collaboration with Kale Group						
Monday: 13.40-17:30, Thursday: 08:40-12:30 and 13:40-17:30						
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Project II starts. Project brief delivered. Research brief delivered. 14	15	16	Scheduled crits for literature search and user observation 17	18	19	20
Literature review and user observation presentations Insights memo (individual submission) 21	22	23	Matrix: Individual submission Sıla: Participatory workshop briefing 24	25	26	27
Participatory workshop: "A sister school from Mars" @ Ayşeabla okulu 28	29	30	Clay workshop Design drivers workshop Uzman sunumu: Mehmet Onur Yılmaz Dec. 1	2	3	4
Crits: with two alternative scenarios Course withdrawal applications start. 5	6	7	Scheduled crits: with full size mock-ups 8	9	10	11
12	13	14	**Preliminary jury** 15	16	17	18
User evaluation 19	20	21	Scheduled crits 22	23	24	25
Crits 26	27	28	Final screening for design boards and technical drawings 29	30	31	Jan. 1
2	3	4	**Final evaluation of project II.** 5	LAST DAY OF CLASSES 6	7	8
FINAL EXAMS 9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	Submission of grades by 24:00 29

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APPENDIX C

CO-DESIGN SESSION BRIEF

Middle East Technical University Faculty of Architecture Department of Industrial Design Fall 2016-17 ID 301 Industrial Design III
Asst. Prof. Dr. Harun Kaygan, Asst. Prof. Dr. Fatma Korkut, Part-time Inst. Dr. Senem Turhan, Part-time Inst. Funda Özkan, Part-time Inst. Tuğba Ülker, Res. Asst. Itır Güngör Boncukçu, Res. Asst. Mert Kulaksız

Sustainable hygiene: Washbasin and accessories for primary schools in collaboration with Kale Group

A sister school from Mars:
Co-design workshop with children

> 28 November 2016 Monday 13:00-17:00
> **The school bus will leave at 13:00. Please do not be late.**

Introduction

This workshop aims to integrate children into the early phases of design process as design partners in order to gather user requirements, explore their habits and skills concerning hand hygiene and oral hygiene, and gather their ideas about "a dream school bathroom."

This will be achieved by establishing a shared narrative in which children take part to accomplish specific missions. The narrative will be about the Martians who want to consult with children from Earth for designing a primary school bathroom which will be constructed on Mars for them.

Participants and setting

We are going to visit Başkent Üniversitesi Özel Ayşeabla Okulu in Çiğdem neighborhood. The participants will be 24 children from 3rd grade (8-9 years old).

There will be 12 teams, and each team will include 4-5 design students and 2 children. The whole workshop will be conducted in Ayşeabla Okulu.

Equipment
- Each team will bring <u>one laptop</u>.
- Each team will bring at least <u>two cameras or smart phones</u> to take videos and photos.
- Each team will bring <u>low-tech prototyping materials and tools</u> for idea generation. These should include at least the following items: Paper (white and colored), pencils and crayons, glue, scissors, and play dough.
    -

Phases
Workshop will consist of five phases:
1. Establishing the narrative
2. Mission one: Decoding signals from Martians
3. Mission two: Exploring the school bathroom
4. Mission three: Proposing a dream school bathroom
5. Presenting children with badges of "Interplanetary Design Champion" [*Gezegenler Arası Tasarım Şampiyonu*]
    -
    -

1. Establishing the narrative
Duration: 10 min

The children will be divided into groups of two by their teachers and each METU team will have two children members in the team. In this phase, you are going to introduce the narrative to the children. They will be told that the Martians decided to construct a school for children visitors from Earth, and they contacted METU Industrial Design students to help them. METU students will introduce themselves as mediators and facilitators with specific roles. After they introduce the narrative and their roles, the first mission will be given.

2. Mission one: Decoding signals from Martians
Duration: 15-20 min

Children will be shown a video sent by the Martians; the video is about three questions asked in Mars language. The questions will be decoded (translated into Turkish) by children through a decoding table that we will provide.

The questions sent by the Martians are as follows:
- How do you wash your hands? (Ellerinizi nasıl yıkarsınız?)
- How do you brush your teeth? (Dişlerinizi nasıl fırçalarsınız?)

- How do you make these activities enjoyable and fun? (El yıkamayı ve diş fırçalamayı nasıl daha eğlenceli hale getiriyorsunuz?)

Each team will go over the questions one by one, and briefly discuss alternative answers. METU students will propose children to pay a visit to the school bathroom to make an exploration together.

3. Mission two: Exploring the school bathroom
Duration: 45 min

In this mission, children will go to the school bathroom together with METU students and perform two activities: washing hands and brushing teeth. First, one child will take photos as the other one washes his/her hands and brushes his/her teeth; and then, they will switch the roles.

The roles of METU students in this mission are as follows:
- Helping children when needed,
- Asking questions about the activities performed,
- Documenting activities (video, photographs and notes).

Before the workshop each team needs to discuss and distribute the roles among the members. For example, one member will take notes, another one will take photographs, another will video record, and the remaining member/two members will collaborate with the children and ask questions. Each team member will have a specific badge (and preferably accessories) which indicate his/her role (e.g. interplanetary translator/photographer, ambassador, etc.) in the mission. Be creative, fun and convincing!

Teams will return back to the workshop space and the children will be given three cards (see Appendix 2) to fill in to answer the questions. Together with the children go through the photographs they took, and discuss the answers the children will write down. Children will fill in the cards, put them into a special envelope (see Appendix 3) to be sent to the Martians by METU students.

4. Mission three: Imagining a dream school bathroom
Duration: 45 min

In this phase, the children will be shown another video in which the Martians will ask children to describe their dream school bathroom. Similarly, they will decode the message and learn about the last mission.

First, each team will conduct a short brainstorming session; you may use sticky papers to write down and/or draw ideas. Then, provide the children with low-tech prototyping tools so that they can describe, draw and/or model their dream school bathroom <u>individually</u>.

When they are ready, each child will take a photograph of his/her work to be sent to the Martians by METU students.

5. Presenting children with badges of "Design Champion"
Duration: 15-20 min

Each child will be given a "Design Champion" badge sent by the Martians to thank them for their help.

INFORMED CONSENT FORM (TURKISH)

Bu araştırma, ODTÜ Endüstri Ürünleri Tasarımı Bölümü Yüksek Lisans öğrencisi Sıla Umulu tarafından tez alan çalışması olarak, ID 531 Kullanıcı Araştırma Yöntemleri ve ID 301 Endüstri Ürünleri Tasarımı III dersi kapsamında gerçekleştirilmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır.

Çalışmanın Amacı Nedir?

Araştırmanın amacı, kullanıcı grubu olarak çocukların ihtiyaçlarını ve isteklerini anlamak amacıyla performans ve hikâye temelli katılımcı tasarım metotlarının kullanımını değerlendirmektir.

Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Araştırmaya katılmayı kabul ederseniz, sizden beklenen, yöneltilen soruları yanıtlamanızdır. Görüşmemiz ortalama 20 dakika sürecektir. Daha sonra değerlendirilmek üzere görüşme sırasında ses kaydı yapılacaktır.

Sizden Topladığımız Bilgileri Nasıl Kullanacağız?

Araştırmaya katılımınız tamamen gönüllülük temelinde olmalıdır. Görüşmemizde elde edilen verilere sadece araştırmacı Sıla Umulu ve aşağıda belirtilen tez danışmanı ve ders yürütücüleri tarafından erişilecektir. Katılımcılardan elde edilecek bilgiler toplu halde değerlendirilecek ve bilimsel yayımlarda kullanılacaktır. Kimlik bilgileriniz saklı tutulacaktır.

Katılımınızla ilgili bilmeniz gerekenler:

Çalıştay, genel olarak kişisel rahatsızlık verecek sorular veya uygulamalar içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir

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nedenden ötürü kendinizi rahatsız hissederseniz görüşmeyi yarıda bırakıp çıkmakta serbestsiniz. Böyle bir durumda araştırmacıya çalışmadan çıkmak istediğinizi söylemek yeterli olacaktır ve kaydedilen veriler silinecektir.

Araştırmayla ilgili daha fazla bilgi almak isterseniz:

Görüşme sonunda, bu çalışmayla ilgili sorularınız yanıtlanacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için yüksek lisans öğrencisi Sıla Umulu (sila.umulu@gmail.com), tez danışmanı Yrd. Doç. Dr. Fatma Korkut (korkut@metu. edu.tr) ve ID 531 dersi yürütücüleri Yrd. Doç. Dr. Gülşen Töre Yargın (tore@metu.edu.tr), Ar. Gör. Aslı Günay (agunay@metu.edu.tr) ile iletişim kurabilirsiniz.

Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum.

(Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

İsim Soyad   Tarih   İmza

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INTERVIEW SCHEDULE (ENGLISH VERSION)

Q1: How do you evaluate the session in general?

    Q1-P1: Why do you think so?

1) INSIGHTS GAINED FROM THE SESSION

    Q2: What are the insights you gained though the session?

        Q2A: Which insights have you planned to utilize for idea generation?

            Q2A-P1: Why do you think so?

        Q2B: In which session phase did you gain these insights? Please explain it for each insight.

        Q2C: Which data did you utilize in reaching these insights?

            Q2C-P1: (concerning the data they did not use) Why didn't you prefer to use them?

2) COMPARISON OF THE OBSERVATION PHASE AND THE DESIGN SESSION

    Q3: What are the advantages of the session in comparison to the observations you made in the user observation phase of the project?

        Q3-P1: Why do you think so?

Q4: Do you think that the session will contribute to various phases of the design process of this project in comparison to the observations you made in the user observation phase of the project?

    Q4-P1: (If so) In what aspects do you think it will contribute?

    Q4-P1: Why do you think so?

3) EVALUATION OF SESSION STAGES

Q5: What difficulties did <u>you</u> face during the session? Please explain stage by stage.

    Q5-P1: What were the reasons for these difficulties?

Q6: Which steps do you think you successfully conducted?

    Q6-P1: Why do you think so?

Q7: What difficulties did <u>children</u> face during the session? Please explain stage by stage.

    Q7-P1: What were the reasons for these difficulties?

Q8: Which phases do you think were more engaging for <u>you</u>?

    Q8-P1: Why do you think so?

Q9: Which phases do you think were more engaging for <u>kids</u>?

    Q9-P1: Why do you think so?

Q10: Which phases do you think were less engaging or boring for <u>you</u>?

    Q10-P1: Why do you think so?

Q11: Which stages do you think were less engaging or boring for <u>kids</u>?

    Q11-P1: Why do you think so?

4) EVALUATION OF IDEA GENERATION PHASE

Q12: What are the experiences you have gained during the idea generation phase of the session?

Q13: What are the creative and interesting observations you made in this phase?

Q14: Which materials you provided in this phase was used more effectively by the kids?

    Q14-P1: What kind of artefacts these materials were used to create? Why do you think so?

    Q14-P1: Did they combine the materials? If so, how did they combine these materials?

5) EVALUATION OF COLLABORATION DURING THE SESSION

Q15: How did the methods used in the session affect the collaboration between you and the kids?

    Q15-P1: Why do you think so?

Q16: How did the methods used in the session affect the collaboration among the kids themselves?

    Q16-P1: Why do you think so?

6) SUGGESTIONS

Q17: What are your suggestions for improving the session?

INTERVIEW SCHEDULE (TURKISH VERSION)

Q1: Çalıştayı genel olarak nasıl buldunuz?

    Q1-P1: Neden böyle düşünüyorsunuz?

1) ÇALIŞTAYDAN ELDE EDİLEN ÇIKARIMLAR

Q2: Çalıştaydan elde ettiğiniz çıkarımlar nelerdir?

    Q2A: Bunlardan hangilerini fikir geliştirmede kullanacağınızı düşünüyorsunuz?

        Q2A-P1: Neden böyle düşünüyorsunuz?

    Q2B: Bu çıkarımları çalıştay sürecinin hangi aşamalarında oluşturdunuz? Lütfen her bir çıkarım için değerlendiriniz.

    Q2C: Bu çıkarımları topladığınız hangi verilerden faydalanarak oluşturdunuz?

        Q2C-P1: (eğer kullanmadıkları bir veri varsa) Neden bu verileri kullanmayı tercih etmediniz?

2) GÖZLEM VE ÇALIŞTAYIN KARŞILAŞTIRILMASI

Q3: Projenin ilk aşamasında yaptığınız kullanıcı gözlemiyle karşılaştırdığınızda, genel olarak çalıştayın ne gibi faydaları oldu?

    Q3-P1: Neden böyle düşünüyorsunuz?

Q4: Daha önce yaptığınız gözlemlerle karşılaştırdığınızda, yaptığınız çalıştayın tasarım sürecinin değişik aşamalarına katkıda bulunacağını düşünüyor musunuz?

    Q4-P1: Hangi açıdan katkıda bulunduğunu düşünüyorsunuz?

    Q4-P1: Neden böyle düşünüyorsunuz?

3) ÇALIŞTAY AŞAMALARININ DEĞERLENDİRİLMESİ

Q5: Çalıştay sırasında ne gibi güçlüklerle karşılaştınız? Lütfen aşama aşama açıklayınız.

    Q5-P1: Bu güçlüklerin sebepleri nelerdi?

Q6: Hangi aşamaları başarıyla yürütebildiğinizi düşünüyorsunuz?

    Q6-P1: Neden böyle düşünüyorsunuz?

Q7: Sizce çalıştay sürecinde çocukların karşılaştıkları güçlükler nelerdi?

    Q7-P1: Bu güçlüklerin sebepleri neler olabilir?

Q8: Sizin açınızdan hangi aşamalar daha eğlenceliydi?

    Q8-P1: Neden böyle düşünüyorsunuz?

Q9: Sizce hangi aşamalar çocuklar için eğlenceliydi?

    Q9-P1: Neden böyle düşünüyorsunuz?

Q10: Sizin açınızdan hangi aşamalar daha az eğlenceliydi ya da sıkıcıydı?

    Q10-P1: Neden böyle düşünüyorsunuz?

Q11: Sizce hangi aşamalar çocuklar için daha az eğlenceliydi ya da sıkıcıydı?

    Q11-P1: Neden böyle düşünüyorsunuz?

4) FİKİR GELİŞTİRME AŞAMASININ DEĞERLENDİRİLMESİ

Q12: Fikir geliştirme aşamasında edindiğiniz deneyimler nelerdir?

Q13: Bu aşamada size yaratıcı ve ilginç gelen gözlemleriniz nelerdir?

Q14: Çocuklar bu aşamada sunduğunuz malzemelerden hangilerini daha etkili bir şekilde kullandılar?

Q14-P1: Malzemeler ne tür prototipler yapmak için kullanıldı? Neden böyle düşünüyorsunuz?

Q14-P1: Materyalleri birlikte kullandılar mı? Eğer kullandılarsa nasıl bir araya getirdiler?

5) ÇALIŞTAYDAKİ İŞ BİRLİĞİNİN DEĞERLENDİRİLMESİ

Q15: Sizce çalıştayda kullanılan yöntem siz ve çocuklar arasındaki iş birliğini nasıl etkiledi?

Q15-P1: Neden böyle düşünüyorsunuz?

Q16: Çalıştayda kullanılan yöntem çocukların kendi aralarındaki iş birliğini nasıl etkiledi?

Q16-P1: Neden böyle düşünüyorsunuz?

6) ÖNERİLER

Q17: Çalıştayı iyileştirmek konusundaki önerileriniz nelerdir?

QUOTATIONS (TURKISH VERSION)

(Q1) Fırçalarken ki davranışları da biri onları izlediği için daha özenliydi. Kendilerini özgür hissetmediler. Ne yapsak diye bize sordular. Aslında o normalde ne yapıyorsa yapacaktı biz gözlemleyecektik. Yani belki yanlış yapmaktan korktular.

(Q2) … zaten istemedi bizim çocuklar diş fırçalamayı. Hani bir tanesine böyle biraz zorla yaptırdık. Sonradan geldi falan gibi. Biz de o zaman fırçalama falan dedik. Bir şey demedik.

(Q3) …ama bir tek tek kâğıt verip doldurmalarını istediğimizde kendi aralarında yarışmaya başladılar. Aralarında bir gerginlik yaşandı. En sonda da kavga ettiler zaten

(Q4) Yani o kâğıtlar çok büyük olduğu için onları dolduramadılar çünkü ne yapacaklarını bilemediler, yazsak mı, çizsek mi falan…

(Q5) Kafasında el yıkamak zaten bir eylem olarak var ama işte detaylı düşünemedi mesela. Parmaklarının arasını yıkamak, ovuşturarak, bileklerini yıkamak gibi eylemleri…

(Q6) Hani biz biraz yardımcı olduk. "Ondan sonra ne yapıyorsunuz işte sabun mu?" falan gibi. Çünkü çok geride duruyorlardı.

(Q7) Belki konu ilgilerini çekmedi. Bilmiyorum ne önerebilirim ama çocukların eline süslü bir şeyler verdiğimizde asla istediğimiz bir geri dönüş alamayız aslında. Ben de vermiyordum zamanında. Yani insan daha çok kendi kafasına geleni çiziyor. Kız orada şato çizdi. Gel lavabo yapalım diyoruz yapmıyor. İşte bir diş fırçası yaptım uçuyor falan hani. Biraz oyun gibi gittik onlara. Onlar da bize yardım etmeleri gerektiğini anlamadılar.

(Q8) Çocuklara Marslı deyince çok uçtular. Her şey çikolatadan olsun, her şeyi yiyebilelim gibi şeyler oldu.

(Q9) Şimdi uzaylılarla konuşmuşuz gibi düşünüyorlar bizi. Bizi ister istemez zaten otorite konumuna koyuyorlar. Doğal olarak çekindiler tabi bizden.

(Q10) O yaş grubu çok zor oluyor. Benim annem ilkokul öğretmeni ve o yüzden ben çocuklarla daha çok iletişime geçmek zorunda kalıyorum. Her gidip geldiğimde. Hep zor oluyor zaten bu yaştakilerle iletişime geçmek.

(Q11) Hoca gelip hani biraz hızlanmanız lazım demek zorunda kaldı bize. Yetişmiyordu çünkü. Olacaktı gibi yani ama biz de gerildik yetişmeyecek diye.

(Q12) … zaten süreyi de aştık. İkinci sorudayken hoca geldi ve hadi artık bitirin dedi. Bu yüzden çocuğa geri kalan soruların cevaplarını biz söyledik.

(Q13) Zor olan onları yönlendirmek oldu. Çünkü ellerine kağıt kalem verdiğimizde, hani yaratıcılıklarını ölçmek için verdiğimiz şey vardı ya, o esnada çocuğu sen bir musluk çiz bakalıma doğru yönlendirmek zor oldu.

(Q14) Oyunlarda mesela, biraz karışıklık oldu ilk başta. Hangi oyunu oynuyoruz şimdi, hocalar da tam bilmiyor herhâlde, gelip bizim kafamızı karıştırıp geri gittiler.

(Q15) Çok sıkışık bir yerdi. O güzel değildi. Başka muhabbetler döndürüyorduk mesela ve o benim dikkatimi dağıttı. Çocukları da etkilemiştir diye düşünüyorum. Çok curcunaydı. Biz sakin kalmaya çalışıyorduk ama kafamızın üzerinde kağıtlar uçuşuyordu.

(Q16) Bence baya faydalıydı. Öğrencilerle başka şekilde bir arada olama şansımız yoktu ve hikaye de eğlenceliydi. Biz de eğlendik onlar da eğlendi bence. Akıllarında kalan bir gün olmuştur herhâlde.

(Q17) Daha faydalıydı çünkü çocuklar çok çekingen oluyor. Değişik bir yaklaşım sergilediğimiz için ve hikaye de eğlenceli olduğu için daha rahat oldular. Fikirlerini açıklar oldular.

(Q18) … çünkü çeviriyi bırakamadılar. Hem bizim isimlerimizi hem de kendi isimlerini çevirmeye başladılar. Orada da baya eğlendiler bence.

(Q19) Tuvalette birbirlerini videoya çekerken eğlendiler. Dans ettiler falan. Çok garip videolar var. Video kısmında baya eğlendiler yani.

(Q20) Birbirlerinin fotoğraflarını çektikleri aşamayı sevdiler. Aslında orada açıldılar. Daha önce gerginlerdi.

(Q21) …bir sürü boya kalemi verdik, hamur verdik. Onlarla bir sürü şey yaptılar. Kağıt kestiler falan. Özellikle hamur kısmı oyun gibi geldi onlara. Önce yaptılar sonra bozup tekrar yaptılar.

(Q22) O aşama şey olarak iyiydi. Bizimkiler dedim ya hani çok konuşmuyorlar diye. Orada mesela hemen bir şeyler yapmaya başladılar falan. O açıdan baya iyi oldu… hani bizimle konuşmadan kendisinin bir şeyler yapıyor olması.

(Q23) Bu sefer galiba biraz daha detay yaptılar. Hani işte ne bileyim desenler ya da burada böyle bir özellik var gibi.

(Q24) Tuvalet ortamıyla fikirleri arasında bir bağ kurmaya başladılar. Ilk önce bir tuvalet planı yaptılar zaten. Sonrasında fikirlerini o planın üzerine oturttular.

(Q25) Eve gittiğimizi ben saymıyorum. Çünkü önemli olan onları okul ortamında gözlemlemekti. O konuda çok iyi oldu. Çocuğu tasarlayacağımız şey üzerinde, iş üzerinde görmüş olduk.

(Q26) Okullarda çocuklarla sizi konuşturmuyorlar. Yani hiçbir şekilde çocukların fotoğraflarını çekemezsiniz, hiç bir şekilde iletişime geçemezsiniz. O yüzden çocuklarla değil de hocalarla ve görevlilerle konuşmuştuk. Bu çalıştayda çocuklarla konuşabildik.

(Q27) Okulda olması faydalıydı, bir de biz okulda yaptığımız gözlemde daha çok tuvaletleri falan gözlemledik, hani bire bir onların kullanımını çok gözlemlemedik çünkü dişlerini fırçalamıyorlar okulda. Yani o diş fırçalama habitlerini direkt okulda nasıl yapacaklarını gözlememiz iyi oldu.

(Q28) çocukları anlamak açısından daha iyiydi. Orada birazcık daha hani (…) çocuklarla çok zaman geçirmedik. Kısa kısa konuştuk. Birkaç şey söylediler.

(Q29) Çocuklar için bir şey tasarlamak için onlarla birlikte olmak gerek. Mesela benim aklımdaki çocuk algısı baya farklıydı. Yani mesela çoğu yetileri yok. Onu görmüş oldum ben. Bunlar baya salaklarmış dedim.

(Q30) Bir de hocalarla konuşurken çok güzel delil olarak kullanabiliyorsun. Burasını neden böyle yaptınız dediklerinde, çalıştaydan edindiğimiz bilgilere göre şöyle şöyle diyebiliyorduk.