

# Not just bits of paper: design sessions with children

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## Abstract

This paper aims at presenting different ways to involve children in the design sessions and to include the outputs in the process of designing technologies for children. As a result of our experience in the Child Computer Interaction field, we strongly believe that involving children in different phases of the process is vital to ensure that most of the requirements needed are included. After a brief introduction to participatory design methods, this paper describes the way we run design sessions with children, and includes some examples, and cautions to be aware of when analysing the outputs.

## 1 Introduction

Debates in Human-Computer Interaction (HCI) have concerned different ways to involve users during the design process and, providing successful products that actually meet users' needs. Traditional 'user-centred' approaches used to engage users in testing and evaluating system functionalities (Rubinstein et al. 1984). Work by Gould and Lewis (1985) suggests that good design results from an early focus on the users. This can be done by working closely with the users and asking their preferences, modelling the users and their tasks, or using guidelines that have been derived from related work. More recent approaches are positioned on the other end, such as the Participatory Design one, where designers give to users a more responsible role including them in the design phase as equal partners (Scaife et al. 1997).

Most of the software that is intended for children is designed with very little input from children themselves. It is typically designed and built by adults who often have very little idea about what children want and need from interactive products. There is a growing body of research on developing interactive products for children and on examining the different levels of involvement that they can have during the system lifecycle.

Current research (Facer et al., 2004) has identified four main categories of the way to involve children throughout the design development, according to the role they may cover:

- Observation: users observed in performing existing activities and/or in specific or natural settings while they use the prototypes. This can take place at the beginning, during, and on completion of the design process, through user observation and ethnography methods.
- Testing: children observed testing technologies and asked to provide feedback through interviews, questionnaire and think aloud techniques, most commonly used at the end of each development phases.
- Informant design: children seen as experts, informing designers of key issues related to their experience, helping to develop early design ideas and testing prototypes in development.
- Participant design & cooperative inquiry: children work as equal members of the design team, helping in identifying problems and solutions to improve the technology they may need in support of their activities.

The research team at Maryland, US, have developed a special approach for this sort of work, labelled co-operative enquiry, in which children and adults work together as design partners with all team members, young and old, being valued for their ideas and contributions (Druin et al, 1999), (Alborzi et al, 2000).

In participatory design there is always the need to calibrate the different inputs coming from each participant, according to their specific skills and expertise. When it comes to children as design partners, this difference is even more evident, especially because the domain is often something they know little about and have little experience with. In this respect, research has shown that for children to participate in the design process more effectively, they need to have information about what constitutes good interface design and usability issues (Kafai et al. 1997).

## **2 Gathering requirements for and with children**

Identification of requirements is concerned with determining what a product should do, how it may look and how it should behave; these may relate to many different issues including function, appearance and performance.

There are different processes by which requirements can be identified; some of these processes assume that all the requirements are out there and simply need to be gathered together, others assume that requirements are defined as a result of an iterative and evolving process of investigation. (Preece et al, 2002) use the term ‘establishing requirements’ to describe the process by which the requirements are identified as a result of the joint activities of understanding the users’ needs, data gathering and subsequent interpretation.

When children act as informants, they are essentially contributing their ideas to the overall design of a product. The term ‘informant’ was first used by (Scaife et al, 1997) in a paper that described the different levels of involvement of the children in participatory design and suggested that co-operative enquiry was generally difficult but children could participate in design activities as informants. When children and adults work together, there is a range of forces, including skills, knowledge, environment and security that impact on the relationships and therefore affect the amount of each participant (adults and children) involvement in the activity (Read et al. 2002).

The most suitable approach to any project depends on different factors, starting from the purposes of user involvement, and practical considerations of logistics, funding and so forth (Facer et al. 2004).

### **2.1 Informant design with Children**

Informant design approaches employ children at regular stages throughout the development of new technology prototypes. Children are considered as field experts in identifying problems and strengths from their personal experience.

The objective of informant design is to discover something not previously known, instead of just confirming what the design team thought they knew already. Rather than treating children as equal partners within the development team (as it is in participant design), informant design involves intended user groups at various stages, where and when their expertise can be maximised and their knowledge is required (Facer et al. 1997).

Hereunder, examples of pilot studies of design sessions with children are reported. Each was conducted in a different way, according to the design aim, the context, and the age of children. They were considered as design exercises, which helped to understand the different practices of the method and their effectiveness.

## **3 Design Workshops**

Each design session consists of three main phases: planning, activity and analysis. Most of the design sessions are carried out by using low-tech materials, such as coloured pens, crayons, paper and card. The children are familiar with these everyday materials, which give them more possibilities to shape and express their own ideas. The use of high-tech prototyping tools, such as PowerPoint® software, are less often used and then mainly with elder children,

who already have some experience with them. The motivation for this is to avoid having the children focussing more on the way to use the tools than on the final aim of the task.

### **3.1 Before the Activity**

In planning the activity, we start from the definition of the aim, the expected output, the desirable duration, the type of participants, and the specific features of the setting.

Once the plan for the day is clear to the researchers, it is discussed with the teacher, in order to check its feasibility in terms of dealt contents and effort required from the children.

If there is enough time available, it is always better to run a pilot test with a small sample of children in order to avoid major pitfalls on the conduct of the test and on the achievement of the goals.

When the general structure and the main features are agreed, it is children's turn. It is not necessary that every single detail is planned and controlled: a little level of uncertainty and freedom is advisable to avoid biases due to the adult perspective.

### **3.2 The Activity**

#### **3.2.1 Starting the Activity**

When the children are gathered in the space arranged for the activity, the researchers introduce the members of the design team, the purpose of the activity, and indicate the reason why the children's contribution is being asked.

Once the participants are grouped according to the plan, either by the researchers or by the children choice, each task is explained, using simple language and possibly concrete examples, easily understandable by the children.

#### **3.2.2 During the Activity**

While the children are performing the required tasks, the researchers may be involved with them to a greater or lesser degree. This can be either previously planned or left to the circumstances and it is usually limited to supplying supervisory support and providing additional inputs when needed. The intervention of the researchers can be necessary when possible loss of focus from the main activity purpose occurs and there is a need to bring the children back on task.

In some instances, researchers are mainly engaged in observing the activity, taking records of relevant elements at any stage by taking notes, pictures or video.

#### **3.2.3 Ending the Activity**

To give the children a sense of completion at the end of the session, some time is often scheduled for wrapping up the work and preparing for a little plenary presentation of the outputs, each followed by encouraging/constructive feedback and congratulations.

Before the final thanks and farewell, it is always good to provide an insight of the way the children's contribution is going to be used and whether they can keep the outcomes of their work or if they will be given to them later.

### **3.3 After the Activity**

All the data that is collected is first considered as a whole to get the general overview of the outcomes. At this point, it is possible to decide whether or not the session met the purpose and to decide if the analysis and the related criteria are appropriate for the selected goal. From the same group of data it is actually possible to conduct different analysis according to the particular perspective adopted each time.

The data is then clustered and analysed in order to elicit relevant information for the specific case, and this process can also end up with finding useful results previously ignored.

### **3.4 Examples of Activity**

The first task of the activity usually aims at retrieving information and existing knowledge about the topic and evoke the related context, especially when it is different from the one they are in at the moment. This can be done by giving a short introduction, telling a brief story and/or showing some evocative pictures.

After that, the children are engaged in a brainstorming session, asked to write down ideas, using key words or drawings to express the concepts. Usually they are provided with post-it notes, so that each concept is easily identified and can be used afterwards. When all the notes are collected, they can be gathered in a few clusters, categorised by common factors in order to define the relevant contents.

When it comes to functionalities, the children have to write steps of possible actions the tool will be able to perform, no matter how realistic they could be. When it comes to navigational features, it usually helps to ask them to think of some games and try to create one related to the specific topic. This helps them to understand the logical structure using what they are more familiar with in terms of elements and relations involved in the activity.

The list of actions or instructions produced during interaction design are then translated into drawings representing the interface and the sketch of the prototype they are going to reproduce with the low-tech material. Often, the final output is quite different from the initial ideas, but this is useful to see the development behind it and the sequential evolution.

## **4 Conclusions**

Working with children is undoubtedly helpful to retrieve a first hand insight of the interests, needs and preferences of the children from the initial phase of the design process. As mentioned by Facer et al. (2004), this method provides some novel and interesting suggestions to take into consideration, enabling developers to ‘free-up’ their ideas and develop more innovative and creative resources. It is a useful way for developers to be surprised by users and to avoid producing predictable results. It also helps to avoid costly mistakes and to identify difficulties of design at an early stage of the process.

Despite all the benefits, involving users during the design process has some costs, especially in terms of time and resources management; these costs may prevent some projects from using this method.

Although users insights give a great contribution to the design, increasing quality, relevance and effectiveness, researchers need to pay much attention on how to handle the data and translate it into valuable inputs for the design. The outputs from design sessions with children can be biased by many factors that need to be taken in to account when analysing the results. These biases may be due to particular conditions of the context at the moment the activity took place, the specific selection of participants or the interference of the researchers. All these factors and the feasibility of users ideas require the researchers to be aware when including them in design.

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