

Friends sharing Opinions: Users become Co-researchers to Evaluate Design Concepts.

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Abstract: The role of users in design is diversifying and increasing. Besides product evaluations and idea-generation sessions, users can collaborate in research that aims to find requirements for design by acting as researchers themselves. Earlier studies have addressed a variety of reasons why giving users the role of co-researcher makes sense: users have easier access to the target group (of which they are an active part), speak the same language or are a cost-efficient workforce. A previous study [2] explored the merits and constraints of using children as co-researchers in contextual user research, interviewing peers and family members. This current paper explores two follow-up questions: Can this method also be valuable for the evaluation of design concepts? What differs when other target groups than children become co-researchers? These questions are answered by describing a case in which children, elderly and students performed as co-researchers by interviewing their peers to evaluate design concepts. Comparing this case to the previous one reveals the differences in using co-researchers from different target groups and for different research purposes. We found out that the interfering factor of the co-researcher can have an enriching effect on the research findings.

Key words: *Co-researchers, Research Collaborators, Concept Evaluation, Participatory Design*

1. Introduction

In participatory forms of Human Centered Design (HCD), designers cooperate with users throughout the process: to evaluate designs, but also to inspire and inform designers in the fuzzy-front end of the design process as sources of contextual knowledge. One method for conducting contextual research with users is Contextmapping [7], in which users are guided in observing and reflecting on their lives, and become aware of their experiences, wishes and needs. This current study builds on insights from the study of van Doorn et al [2], in which children were placed in the role of co-researcher in order to gain contextual knowledge about the lives of their peers and grandparents. In the current study we extend that work to the evaluation of design concepts and to involvement of children, students and elderly as co-researchers.

1.1 The benefits of co-researchers

Employing a co-researcher who him/herself is part of the intended target group can have several benefits. First, a larger group of users can be reached in a cost-effective way. Second, co-researchers from the target group have easier access to their peers and may be able to select and motivate participants better. Third, they can speak their

language and make comparisons to their own experiences. And finally fourth, these collaborators might even become “super sources” who deliver other insights than ‘normal’ participants, possibly because they feel more connected and think about the research and themselves in another way than normal participants [2].

1.2 Co-researchers in earlier studies

Participants acting as researcher collaborators have featured previously in Action Research (AR) [5]. AR and its variants involve participants as collaborators mainly for the effect on the participants themselves: to empower them to take control over their situation. One of the few authors mentioning that there may be an influence on the quality of the research findings as well is Kelleth [4], who describes a pilot study in which 7 children, aged 9-10, participated in 12 sessions of research method training to acquire a good mind-set, tools and skills in order to define their own research questions and conduct their own research. Kelleth found that: “the results were different [from what the researchers themselves might have uncovered] because children see the world differently and ask different questions, have different concerns and have immediate access to peer culture where adults are outsiders.”

Pries et al [6] used research collaborators in the design of an on-board resting place in airplanes. In his study passengers conducted research with flight attendants (the target group) during flights about the latter’s wishes and needs. This approach enabled the team to conduct in-flight research without having to be on the flights themselves.

Druin [3] describes a design approach called cooperative inquiry, which aims to give children influence in the development of technology, by having them participate as researchers in intergenerational teams. Druin points out that between children and adults, traditional “power structures” can emerge in which adults steer children.

Another example of a design project in which children are employed as research collaborators, is the “Kid Reporter” project, by Bekker et al [1]. Within this project, children collected data inside a zoo (e.g. by interviewing others) and reported their findings in the form of a newspaper. The findings were used as inspiration for an interactive game. Bekker found that the children provided detailed information and the fact that they were allowed to make up their own questions for parts of the interview allowed them to tell the story they wanted to tell. The insights from the children helped the designers to gain knowledge about this specific age group and provided new ideas.

1.3 Roles when employing co-researchers

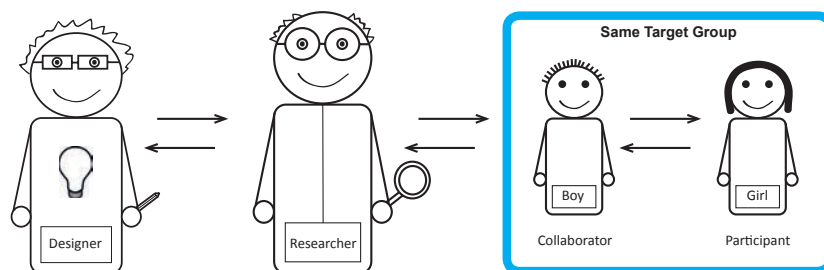


Figure.1 Roles when Employing co-researchers

In figure 1 the different roles are defined that play a part when using research collaborators. The **designer** wants input from users to get informed and/or inspired. Sometimes he conducts the research himself, but often a

researcher takes on this job. In figure 1 the boy is a research collaborator, or **co-researcher**. He receives training and tools to conduct research with one or more participants. The **participant** is someone close to the co-researcher from the same intended target group.

1.4 Aim of this study

This paper focuses on a case study in which co-researchers from different target groups were recruited to evaluate design concepts with peers. We will investigate if co-researchers are able to obtain valuable evaluations of design proposals from and with their peers and if the exploration of other peoples’ opinions will help them to form and express their own opinion. Children, students and elderly were recruited as collaborators in order to find out differences between these target groups.

1.5 ProFit

This study is part of the *Profit* project, in which FieldLabs will be realised in different cities in Europe [www.profitproject.org]. A FieldLab for sport innovation is a research and development location in a real-life setting where citizens engage in sports and play activities. Companies can install new product prototypes or production models in the FieldLabs for the end-users to use and test them. The present study was conducted to evaluate designs from a design competition, of which the winners will be placed within the ProFit FieldLabs.

2.1 Case Study

In two of the cities that participate in the ProFit project, Delft and Eindhoven (The Netherlands), the submitted design concepts were evaluated with co-researchers from the FieldLab target groups. These co-researchers performed interviews with peers to gather more opinions and to ground their own opinion. These opinions were input for juries (figure 2), to help them decide the winning concepts, which will be placed in the FieldLabs.



Figure.2 Evaluation reports given to juries

2.2 Procedure

Six co-researchers were selected: four in Delft and two in Eindhoven. These co-researchers represent the three target groups of the FieldLabs in Delft and Eindhoven: two children (aged 9-12), two youngsters (aged 20-21) and two elderly (aged 65-74). Each co-researcher interviewed two peers from the same target group and reported about their findings in a feedback-session. A total of 18 people were involved in this study, either as collaborator or participant.

During the preparation, the co-researchers were instructed on how to perform the interviews and received voice-recorders and two research booklets. The purpose of the booklet was to guide the co-researcher in the course of the interviews by explaining the aim of the research, giving interviewing tips and providing structured questions. During the interviews the co-researcher wrote down the answers to the questions in the booklets. The booklet started with questions about the relationship of the co-researcher and his/her participant, followed by the explanation of the 5 concepts on pages placed in envelopes on the left, and questions about the concept designs on the right pages (figure 3). The booklet ended with assignments requiring a comparison of the concept designs, such as “Put the concepts in order of preference”, “Which one fits you best and why?” or “Which one do you think others like best and why?”



Figure.3 Two pages from the Research Booklet

Each co-researcher conducted interviews with two peers. After 1 or 2 weeks the co-researchers came together with the researcher for a feedback session in which they reported about the interviews and arranged all concepts around a bulls-eye to express their order of attractiveness. Subsequently they were given some words, abstracted from a contextual user research, which had been conducted before the competition. The co-researchers pasted the different words on the concepts of their choice and explained their reasoning (figure 4). The opinions and reactions of the co-researchers and participants on the concepts were gathered and combined into an overview that was presented to the FieldLab juries in Delft and Eindhoven (figure 2).



Figure.4 Bulls-eye with concept and words

2.3 Analysis

In order to gather insights on the used method, all audio files from the interviews and feedback sessions were transcribed and these texts and the research booklets were analysed by highlighting important quotes and turning them into statement cards. These cards were clustered into categories. The reactions of the co-researchers in the feedback sessions were compared to the original source information from the interviews between the co-researchers and their participating peers.

3. Results and Discussion

In this section the main insights from the case study will be discussed. Three important subjects will be addressed: The different roles, the tools that supported these roles and the way opinions are expressed. At the end of this section the research questions will be answered.

3.1 Roles

Roles of people turned out to be an important aspect of the co-research method that influences the attitude of the people involved and the results. The role of the co-researcher, the participant and the researcher (figure 1) will be explained in detail below.

Role of the Co-Researcher – Involved and responsible

The role of the co-researcher is clearly established at the beginning of the interview when the voice-recorder is turned on and co-researcher introduces his participant by clearly mentioning who will be interviewed. This start structures the interview and creates a frame in which the roles of co-researcher and participant can be played.

Student-collaborator: “A very good evening! This is Max, and opposites me sits Teun, tell something about yourself Teun!”

Elderly-collaborator: “We started with the interview with Leo. Today is the 9th and hereby I ask permission to do this interview with you, do you agree?”

During the interview, the role of co-researcher is played with great sincerity; the co-researchers help their participants and guide them through the process. They encourage the participants to give their own opinion; they don't interrupt and listen carefully, accentuating the expert role of the participant. But sometimes situations occur in which their role becomes less secure. An example is when the child collaborators have problems with reading or writing and their participants start to help them. This causes irritation and gets them out of their focus.

The co-researchers felt responsible for the outcomes of the interviews. This can be illustrated with the following example: In one of the interviews two participants got involved in a lengthy discussion, stating the same arguments over and over again instead of following or filling in the questions in the booklet. The responsible co-researcher filled in the booklet afterwards, probably feeling ashamed of the result and motivated to perform this extra activity.

The specific role of the co-researcher also finds its way into the feedback session when their responsibility is expressed at the start, for example by the children collaborators who apologise for their writing style or for participants that were not that serious. Short answers from participants during the interviews are elongated and sometimes enriched by additions and opinions of the co-researchers in the feedback session in order to seem substantial, probably because of their feeling of responsibility. Especially the students reported lengthy about the

answers from their participants in the feedback session, but when actually listening to their interviews, the answers of the participants were short.

Some co-researchers started thinking on a methodological level: One elderly collaborator reported that he took the liberty of experimenting with the procedure. He interviewed one participant in the instructed way, i.e. doing the interview and writing answers down in the booklet. His other participant, however, filled in the booklet on forehand and during the interview they discussed the answers. The co-researcher backs up his decision with the argument of being unbiased, but efficiency might also be a motive because the participant was already present at the interview with the other participant.

Role of the Participant – enthusiastic and curious

Most of the times the participants are placed in the role of expert by the co-researcher. Their motivation to join was their relation with the co-researcher, they are happy to help a friend, and their curiosity about the concepts. Some participants are very involved and almost take on the role of co-researcher themselves. For example: most co-researchers skipped the first assignment in the research booklet, which was “paste a picture of yourself and your participant here”. One participant, however, didn’t agree and wanted to find or make a picture to add to the booklet. In this case the participant took even more initiative than the co-researcher. Another example is one of the elderly participants who was very involved in the research and slightly took over the co-researchers’ role when he took the booklet and started writing his answers in the booklet himself. This particular participant was so focussed on writing that he did not even hear the follow-up questions of the co-researcher, leaving the latter a bit puzzled and detached. This occurrence was not beneficial for the interview and made the recording slow and one-directed because every word was written down directly and there was not much interaction between the participant and the co-researcher.

As said before, sometimes the children have trouble reading or writing, this takes time and is boring for the participants, who don’t have much to do. But not only the children cope with this problem; the elderly and students also take time to write. Sometimes participants use this “break” to talk, leading to interesting additions to their answers. Other participants don’t say anything during these pauses; they really need follow-up questions to keep them going. When the co-researcher is focussed on writing he cannot concentrate on asking follow-up questions.

Sometimes valuable insights are recalled to a participant’s memory after the actual research. This method, using co-researchers, provides a way to record these extra thoughts because the co-researcher and participant see each other regularly. All co-researchers and participants had an informal gathering right after the interview.

Elderly-collaborator: “After the interview we discussed the booklet and we came to the conclusion that we forgot to mention some things, so we will add that now in a new recording”

Role of the Researcher - Meta-Researcher

The role of “researcher” is in this case a complicated one. The researcher (figure 1) conducts the research by facilitating the co-researchers and by gathering the opinions from the booklets, the feedback sessions and the audio files from the interviews. But, in this case, the researcher (who is also the first author of this paper) also considers the events on the level of a meta-researcher when evaluating and improving the method.

3.2 Role-enhancing tools

The voice-recorders proved to be props that enhance the professional role of the co-researchers. They helped them to get into this role and to feel important. The recorder gives structure to the interview and on the other hand freedom of content. At the start of the interview some participants had to get used to the recorder and their co-researchers tried to make the participants feel at ease by explaining what will happen or making a joke about it.

Student-collaborator: "Strange that this is audio recorded, right? But after a while you don't notice anymore..."

When the co-researcher and the participant use the voice-recorder, they know that the researcher is going to listen to their recording later. Especially at the start and end of the interview this is in their head and sometimes the co-researcher asks specific questions to the participant, which he/she already knows the answer to, because he wants the participant to say it aloud for the researcher.

Elderly-collaborator: "I heard that you organized a lot of activities for this neighborhood, can you tell something about that?"

Sometimes a comment or side note is directly aimed at the researcher:

Student-Collaborator: "This is the end of the interview, bye! I will see you tomorrow at the feedback-session!"

Child-Collaborator: "I don't know how you write this word, you should find out how to write this Fenne <name of the researcher>."

Or they talk about the researcher:

Elderly-participant: "I think this presentation is beautiful, how Fenne <name of the researcher> made this"

In case of the children they sometimes play with this "presence" of the researcher. Some comments are directed towards the researcher, and some deliberately hidden:

Child-collaborator: "Do you know what was really cool, I had a teacher who..... (whispers inaudibly)"

Child-participant: "Hahaha ok"

In some cases the children talk about the recorder as towards another person at the table:

Child-participant: "Oh, he made that up! I did not say that recorder! Don't complain with me!"

Even though they know that the researcher is eventually going to listen to the recording, when listening back to the audio recordings the informal and relaxed conversations between the co-researchers and the participants gave us the feeling that this did not change the personal atmosphere and interaction during the interview.

In this case study the voice-recorders were provided to the co-researchers. In the previous one [2] the co-researchers were asked to use their own recording device. Providing them has great advantages, the co-researchers feel proud that the researcher trusts them with this equipment and they cannot hide behind excuses of not being able to record.

3.3 Expression of opinions

The feedback sessions of the student and elderly collaborators gave a good and rich overview of the opinions stated in the interviews. However, the children collaborators had a hard time to remember the answers from the interviews and their research booklets have short sentences or keywords that don't always represent the answers from the participants.

Researcher: "Did she explain why she found it nice and boring?"

Child-collaborator: "Mmm.... I forgot"

During the feedback sessions the elderly collaborators stated that they have the same opinion as their participants. This mutual opinion was formed during the interviews and discussions but when asked in the feedback session different arguments and opinions can still be separated and explained to the researcher. The students and children didn't have this mutual final opinion.

As stated before, short answers from the interviews are sometimes presented elaborately in the feedback session. More arguments are added, sometimes not even mentioned in the interview, often displayed as the opinion of the participants. The co-researchers also give arguments from the competition's point of view, e.g. does it fit the aim of the competition, and does it fit the stated target group. Most arguments put forward in the interviews were of a practical nature, i.e. it will become dirty. In the feedback sessions the co-researchers had the same kind of arguments, but on top of that they paid more attention to their own context and experience. Striking in the elderly sessions was that they sometimes reason from a broad statement to their own experience, maybe to see the reaction of the researcher before sharing it as a personal statement, and sometimes the other way around; from a personal statement to a broader theme, to give it more weight.

Elderly-collaborator: "Some elderly, when they see this kind of playground equipment, get a nostalgic feeling and want to use them again" "I have this tendency too."

Elderly-collaborator: "This was the best one, we really liked it, but a lot of people these days do, right?"

Free to express yourself

It turns out, especially in the elderly interviews, that the participants were more negative during the interviews than the co-researcher in the feedback session. During the interview they feel at ease with each other, the participants know that the co-researchers are not part of the project and that they can give their uncanny opinion. We saw for example a difference between the interview of a student collaborator with his girlfriend or a student-collaborator with her pupil from dancing class; the closer the participant is related to the collaborator the more outspoken he/she is.

One of the elderly participants influenced the interview in a negative way. In her opinion the municipality removed too much small playground equipment and only focuses on big playgrounds. She relates this complaint to the development of the FieldLab and this opinion plays a role in her evaluation of the concepts. The location issue becomes the main topic of a big unstructured discussion in which arguments are repeated and the questions from the booklet abandoned. The co-researcher makes up for this interview in the feedback session by extracting useful arguments from the discussion and adding her own opinion.

Opinion of the co-researcher

The students, and in some instances elderly, took the opinion of their first participant as a guideline to ask follow-up questions in the second interview, measuring if their participants feel the same or differently. They also asked questions that related to their own opinion to measure if their participants feel the same way. Asking this kind of questions is a way to cope with the balance between being an objective researcher and having your own opinion. Some co-researchers struggled with explaining and sharing information on the one hand and being objective on the other.

Student-participant: "Did you see the concepts?"

Student-collaborator: "Yes, but I can not tell you about that."

The co-researchers encourage the participants to give their own opinion. If the co-researcher wanted to share his own opinion he sometimes did this after the participant made a statement, to see if they feel the same way or not.

Student-collaborator: "Ok, I thought this was one of the stronger concepts, but let's move on."

Student-participant: "I think this concept is very complicated."

Student-collaborator: "Me too!"

Sharing their own opinion relieves the co-researchers, but sometimes it causes problems:

Student-participant: "I think you are very enthusiastic about this one..."

Student-collaborator: "No! No no no, you shouldn't say what I think, I know too much, I shouldn't convince you."

Own opinion vs. opinion of others

The participants talk a lot about other groups in society and find it hard to separate their own opinion from the possible opinion of others. An explanation might be that the concepts don't really suit them personally, but they don't mention that. Some co-researchers specifically ask about the more global use of the concepts, but the participants are not experts on that and the researcher is actually more interested in their own potential use of the concepts.

Student-collaborator: "Why does it fit you?"

Student-participant: "Because it is multifunctional and interesting for a large audience"

Elderly-participant: "This is really useful for foreign children living in the Netherlands"

4. Answering the Research Questions

In this section the research questions will be answered and two additional themes will be emphasized.

4.1 Different target groups

The first research question was about using different target groups as co-researchers. The main differences that were found between the user groups concerned motivational aspects and the influence users had on each other. In contrast to the children and students, the elderly needed some time to open up. The first encounter was a bit distant. They did not know what to expect and were short and a bit cold. But after the interviews, during the feedback session they were talkative and involved.

The children were mainly expressing their own opinions, in contrary to the elderly who discussed with their peers until they had the same opinion. The students were intrigued by contrasts: what kind of people liked or disliked a certain concept and why.

It was interesting to see that the same argument can be used in a positive or negative way, depending on the target group. One of the concepts involved blocks of foam. Elderly worry about people throwing with the blocks, this is an argument for them not to choose this concept. Children see this as an opportunity; they like throwing the blocks and see it as a reason to choose the concept but they add the design solution that the blocks should be soft.

4.2 Evaluative Research vs. Contextual Research

The second research question was about the difference between using co-researchers for contextual research purposes and for the evaluation of design concepts. In case of the evaluative research, the co-researchers and

participants talked a lot about others instead of about their own opinion. This was different from the contextual research, which was specifically about their own experiences. In the evaluative research, the elderly talked for example about the preferences of foreign youngsters and small children. It was difficult to keep the topic on themselves because the whole world could profit from the concepts according to their opinion. Even though there was an explicit question in the booklet about their own opinion: “Which one would fit you best?” They still talked about the multi-functionality and how it would serve different target groups. In case of the co-researchers, this behaviour might be encouraged by the fact that they feel like researchers and develop a more general opinion about the concepts. A reason might also be that they did not really feel attracted to the concepts. On top of that, the elderly were thinking about others because they did not see themselves as elderly.

Another difference with the contextual co-research was that the assignments were more evaluative; the participants did not create something but formed an opinion. They are more explicitly put in the role of expert, because they have to judge something. That kind of research fits better to their idea and expectations of being a researcher than sharing contextual information.

4.3 Interfering factor as enrichment

By listening to other opinions co-researchers develop a grounded opinion of their own. If participants don't deliver, the co-researcher makes up for that, turning short answers into rich stories in the feedback session by completing answers with other examples or arguments. Usually the interference of a co-researcher is seen as an influence that needs to be minimized, an unwanted bias [6]. We found that the opinion of the co-researcher is an interfering factor that can be seen as enrichment. By using this method, you get uncanny answers from the participants, filtered and enriched by the co-researcher and presented in a more dense form. This confirms the insight from the previous case study [2] that by using co-researchers you create “super participants”. Next to that the original answers are captured on audio.

During the interviews the co-researchers tried to remain objective, but their opinion can play a part in the discussion with the participant or can be stated at the beginning of the process to see if it changed at the end. This differs from the general use of co-researcher where the focus is on eliminating the influence of the co-researcher instead of making use of it.

4.4 Ambassadors

Within the context of the ProFit project, we experienced that it is difficult and time consuming to recruit participants for research every time a research question pops-up. Putting users in the role of co-researchers gets them involved and responsible and might be the first step in creating a community of research collaborators around each FieldLab. This group needs to feel important, appreciated and connected to the FieldLab and its focus. The elderly and children from this case study felt this connection: They kept track of what is going on in the FieldLab and knew for example which new products were installed. When the FieldLab in Delft was opened, after the evaluative research, four of them were present. The co-researchers knew each other and talked about the project. Together they can reach a big part of the target group. They know what their peers are saying and people can be honest to them because the co-researchers are closer to them than the project researchers.

5. Conclusions

This study explored the use of co-researchers in evaluative design research. The main research questions were about the difference between three user groups (e.g. children, students and elderly) and comparing contextual and evaluative research. Only 6 collaborators and 12 participants were involved, which is not a big amount but they enabled us to explore the research questions. The main differences that were found between the user groups concerned motivational aspects and the influence users had on each other. To start the interview the participants had to overcome a mental obstacle. Especially the elderly needed encouragement and the feeling that they are valuable experts. The children were mainly expressing their own opinions, in contrast to the elderly who discussed with their peers until they had the same opinion. The students were intrigued by contrasts: what kind of people liked or disliked a certain concept and why. An important difference between the research purposes is that in evaluative research the participants are more explicitly in the role of expert, because they have to judge something. As in previous research, we saw the development of “super participants”, i.e., by hearing other people’s opinions the co-researchers developed a grounded opinion of their own. The opinion of the co-researcher can be an enrichment. The insights from this case study will be the basis of a toolkit/method to work with co-researchers that will be designed, tested and further refined.

5.1 Acknowledgements

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