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► To cite this version:

Paula Alexandra Silva, Ana Dias Daniel. Training Non-designers in Co-design Methods Through an Active Assisted Living Interactive Workshop. 17th IFIP Conference on Human-Computer Interaction (INTERACT), Sep 2019, Paphos, Cyprus. pp.166-175, 10.1007/978-3-030-29384-0_10 . hal-02544583

HAL Id: hal-02544583

<https://inria.hal.science/hal-02544583>

Submitted on 16 Apr 2020

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Training Non-Designers in Co-Design Methods through an Active Assisted Living Interactive Workshop

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Abstract. In the era of participation, design and development teams are called to utilize co-design methods in their work and thus required to master the use and appropriate application of those types of methods. However, not all teams, and certainly not all team members, are learned or trained in co-design. This raises challenges not only to the use of co-design methods, but also to its skilful application. This paper reports on an interactive co-design workshop with seventeen EU-funded project coordinators, to investigate their perception on the extent to which the workshop activities impacted their level of empathy towards others, ease of communication, and openness to employ co-design methods. Considering the hands-on and playful nature of the methods, we also investigate participants' perceptions on the methods' ease of application in a real-world context as well as their effectiveness in increasing participants' knowledge of co-design methods. Results indicate that the proposed activities positively contribute to all the dimensions investigated, with the highest effect being achieved in increasing participants' openness to employ co-design methods and the playful nature of the activities being perceived as contributing more to the learning effectiveness than the hands-on approach of the activities.

Keywords: Co-design methods, Training, Active and Assisted Living.

1 Introduction

Product design has been around from the moment that the first artefact was created, received its functional shape, was adapted to satisfy its purpose, and personalised so that its user or owner could be identified. Since then, and as technology became more pervasive, much has changed and the more traditional-oriented approaches have gradually been replaced by more user-oriented ones. Among the latter, we find participatory design, or cooperative design (co-design), as it was originally referred to by the Scandinavian approach [1, 2]. Regardless of its maturity and the general endearment co-design receives from the design community, only recently has this approach been gaining momentum, with studies demonstrating its value [3, 4] and reporting on its use, for example in active and assisted living contexts [5–8]. However, employing a co-design approach can be complicated, demanding, costly, and time-consuming [9],

so R&D teams might be sceptic or even resistant to the notion that user involvement can bring value to the design process and outcomes [10]. One way to address this misbelief is to create opportunities for project coordinators to experience co-design activities and consequently develop their perception and openness to the approach. In this context, this paper reports on an interactive workshop organized with the purpose of introducing and training project coordinators on co-design and the type of activities that can be carried out while practicing it.

In the following sections, we provide a concise background on co-design and present the main design activities conducted during the workshop. Next, we present the research approach taken to identify the workshop impact on participants' skills acquisition, intention of use, perception towards applicability, and perceived learning effectiveness. In the later part of the paper, we present and discuss descriptive results and findings of the workshop impact on the participants' perception, through a post-workshop questionnaire, and outline the contribution of this case study – a set of suitable design activities and exercises – in the field of co-design.

2 Background

2.1 What is Co-Design?

The terms co-design and participatory design refer to a class of design-approaches that stresses the importance of the active, creative participation and collaboration of potential end-users and other stakeholders in the design process [1, 2]. Users are experts of their own experience [10] and as such, when implementing a co-design approach, potential end-users participate actively in the design process as domain experts, working in cooperation, as equal partners, with the design team [11]. As a result of this process, implicit knowledge surfaces, that can be used to inform product design. By working collaboratively with end-users, otherwise missed key design insights can be gathered, thus increasing the chances of creating design solutions and products which are both, relevant and accurate in meeting end-user needs [9, 10]. This generally involves engaging in a number of collaborative activities, the so-called 'generative tools' [11] or 'tools for conversation' [12], that allow users and stakeholders to dialogue and contribute their views, insights, and feedback, throughout the design process, at all stages. Examples of this kind of methods are scarce and the literature also fails to provide effective training approaches on how to develop/apply them.

2.2 Why is Co-Design Important and What Challenges Does it Pose?

Research suggests that including and engaging end-users in the design process allows for effective requirements gathering and increases both user satisfaction and level of acceptance of the final design [9]. To employ co-design practices is also key if aiming at novel [3], differentiated and inclusive solutions [10]. Therefore, if one strives that technology, devices or services are successfully adopted when market-ready [3, 4, 13], to practice a co-design approach is the recommended method. Still, although co-design enables everyone to have a 'voice', be an 'active agent of change', and to con-

tribute their problem-solving capacity, employing a co-design approach can be a challenging endeavour, as it requires the involvement of a large number of stakeholders from diverse backgrounds, each with different personal characteristics [10]. The management of such a collaborative process can indeed be difficult, as the process involves negotiation among stakeholders (for e.g. older adults, formal/informal caregivers, municipalities) [14]. As a result, members of a co-design team need be enabled in order to successfully build familiarity and create trust [3]. Furthermore, for collective creativity to take place, a safe and inclusive environment, where space is made for open dialogues to happen naturally and respectfully, is essential. This requires that members develop skills not only of group communication, to allow for the successful conveying and sharing of ideas, but also of empathy towards others. Another challenge in co-design pertains to resource scarcity [9, 10] both in terms of time and/or money and access to qualified facilitators. If properly addressed, co-design challenges turn out to be unique advantages, especially in contrast to traditional design methods. Co-design is pivotal in building partnerships where feedback is celebrated and exchanged, and it is thus our role, as researchers and practitioners, to find efficient ways of practicing it and effectively training people in such approaches. A successful implementation of co-design may then be able to bypass the, too-often observed, dichotomy of ‘us versus them’ and create value for all stakeholders.

3 Interactive Co-Design Workshop

3.1 Workshop Line-up

The interactive co-design workshop, on which this exploratory study is based, took place on March 12th, 2019 in Brussels, Belgium, as part of a larger event, aimed at training EU-funded projects coordinators on topics, such as end-users’ involvement, business approaches, and administrative reporting. The workshop aimed to introduce and train participants on co-design methods, under the motto “Designing for communities, with communities!” The associated design brief was: “Getting places when I can no longer drive”.

The workshop was meant to mimic, as much possible, an actual workshop with real end-users and was organized in four parts: i) workshop introduction; ii) user understanding; iii) prototyping and ideation; and iv) workshop conclusion. Parts ii) and iii), respectively allocated to user understanding and prototyping and ideation, took the lion’s share of workshop time. Part ii), understanding user goals, resorted to two activities: a role-play and a sailboat exercise. Part iii), dedicated to the early prototyping and ideation, was based on the 6-8-5, or the crazy eights, exercise. Given the absence of adequate training methods, the approach used in the workshop was developed from scratch, to specifically cater for the learning objectives defined for the workshop.

3.2 Role-play and Sailboat Exercise

The opening session was followed by the role-play and sailboat exercises. Role-play was a workshop necessity, as no real end-users participated in the workshop. At the

same time, role-playing a user can support participants' awareness and empathy for end-user needs, hence presenting a learning opportunity. For these purposes, a set of profile roles was created for groups to role-play when working together. Each set of profiles included four roles, each represented by a photo and a descriptive text (**Fig. 1**). The roles included a design researcher, a primary user (older adult), an informal caregiver (e.g. a neighbor, daughter/son), and a role representing a given domain expertise (e.g. company director, municipality representative, health insurance manager).

The sailboat exercise is inspired by agile team retrospectives [15] and has been adapted to be used as a co-design generative tool for user understanding and requirements gathering [16]. In this workshop, the sailboat exercise served as the basis for participants to engage in a shared activity that aimed at the elicitation of user goals and desires, in the context of the design brief "Getting places when I can no longer drive". To assist in this task, a drawing of a sailboat and its surrounding factors, i.e. trade winds, anchor, sun/land, ocean rocks (**Fig. 2**) and a set of prompt questions (**Fig. 3**) were made available, which were meant to facilitate communication and reasoning and to assist in the elicitation of beneficial and/or detrimental experiential aspects.

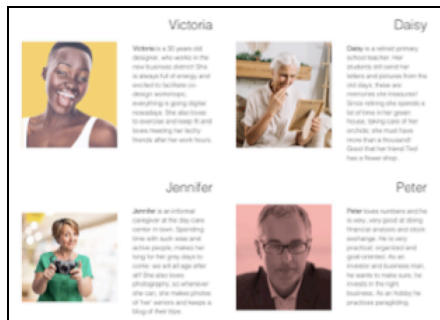


Fig. 1. Set of profiles.

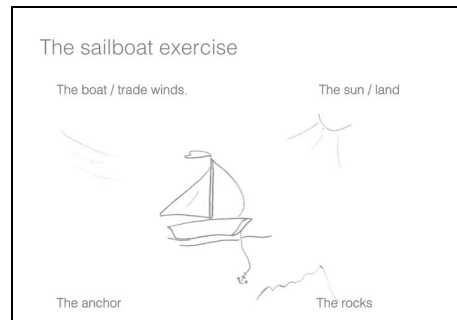


Fig. 2. Sailboat exercise support sheet.

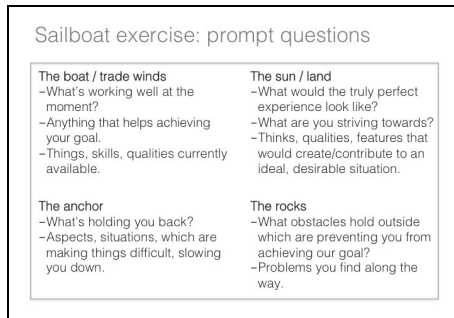


Fig. 3. Sailboat exercise prompt questions.

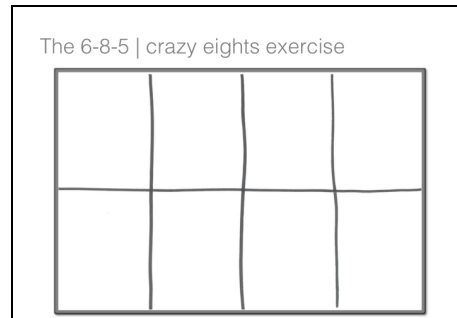


Fig. 4. 6-8-5 exercise support sheet.

3.3 6-8-5 Exercise

Having developed an understanding of users needs, it was possible to proceed to ideation and prototyping. To support this task, the workshop used the 6-8-5 exercise [17],

a rapid ideation and early prototyping method that invites individuals, participating in a design activity, to draw six to eight sketches for a user interface concept in five minutes (allowing ~40 seconds to be spent on each panel). In order to document and discuss the participants' design solution, a blank page with eight panels (**Fig. 4**) was made available to each participant for her/him to envision and draft design solutions.

3.4 Facilitator

The workshop facilitator was an experienced Human-Computer Interaction (HCI) lecturer and researcher with a vast experience in both methods for creativity and innovation as well as in designing solutions for the ageing population and its related ecosystems. A skilled and experienced facilitator is essential [10], as previous research has linked the skills of a facilitator with an overall higher workshop efficiency and increased participant motivation and enjoyment [18].

4 Research Approach

4.1 Participants

The workshop involved 17 participants (five female, 12 male), all of them coordinators of projects funded under the Active and Assisted Living Joint Programme [19]. Participant age varied, with two participants aged between 21-29, six between 30-39, four between 40-49, three between 50-59, and two participants, who were 60 or older. Participants indicated to reside in a variety of European countries, including Austria, Belgium, Denmark, Poland, Portugal, Romania, Spain, Switzerland, and the Netherlands. With regards to the level of education and specialization of the 17 participants, two reported holding a high school diploma, two a college degree, two a bachelor's degree, six a master's degree, one a professional degree, and four a doctorate degree. Participants were from diverse backgrounds, seven from an engineering-related background and four from a finance-related background. The remaining participants were from areas such as communication, psychology, gerontechnology, pharmacy, and marketing. In terms of their work context, most participants described themselves as working in and SME/Business, while another seven were from Research/Academia, and one from an End-user organisation.

4.2 Procedures and Data Gathering

The start of the workshop consisted of a facilitator introduction, an overview of the aim and goals of the workshop and the request to gather anonymous, non-identifying data of the participants through informed consent. Data was gathered through the research materials in the workshop and a questionnaire at the end of the workshop. All participants agreed to take part in the study. Next, participants introduced themselves and the facilitator made a short presentation on the value of co-design. From this point onwards, participants were introduced and given time to perform each of the planned activities, as introduced in section 3.1. First, the participants were

grouped into five teams (three groups of three and two of four). Then, after participants were introduced to the design brief and the rules for ideation¹ and discussion², the activities started. The profile roles for the role-play exercise were randomly picked from the available set of profiles. The sailboat exercise, which outcome was a set of user requirements, elicited with the support of the prompt questions, and the 6-8-5 exercise, which outcome was a conceptual low-fidelity paper prototype, were first performed individually and then collaboratively developed by the team as a group. As the group completed the activities and came up with a concept for their product or service, each group shared the final results with the whole group, in the debriefing session.

As the workshop activities came to an end, participants were invited to fill out a questionnaire about the session. This questionnaire (available on request) was the main tool used for data collection and was organized as follows: i) Demographics: age, gender, level of education, background, country of living, work context, professional role/occupation; ii) Experience and use of co-design methods: level of experience, frequency of use in work context, design cycle phase; iii) Impacts on skills acquisition: empathy, communication; iv) Intention of use and applicability: openness to future use, application to real-world context; and v) Features of activities and learning effectiveness: hands-on approach, playful nature.

The answer format of the questionnaire sections i) Demographic and ii) Experience and use of co-design methods questions was a selection ranged items or an alternative, open-ended response. The remaining questionnaire sections iii) – v) were answered through a seven-point Likert-type scale, ranging from ‘No experience’ (1) to ‘Very experienced’ (7) for experience, from ‘Never’ (1) to ‘At all times’ (7) for frequency of use, and from ‘Totally disagree’ (1) to ‘Totally agree’ (7) for all other questions. From the questionnaire, a coding protocol was developed, after which data was entered and descriptively analyzed in IBM’s Statistical Package for the Social Sciences (SPSS).

5 Results and Findings

5.1 Impacts on Skills Acquisition and Intention of Use

Table 1 shows, with regards to the impacts on skills acquisition and future intention of use, that the three exercises together was the best teaching approach to develop skills related to empathy towards the perspectives of others as well as to communication. This was also the approach that most increased participants’ openness to employing co-design methods in future projects. Scrutinizing each particular exercise,

¹ Rules for ideation were: Do embrace creativity; Do encourage the craziness; Do get ideas on paper – write, scribble, draw, get them there; Do keep mindful of time – the clock is ticking; Do build on the ideas of others.

² Rules for discussion: Do treat each other with respect; Do let others speak; Do remember the design is not meant to suit your own preferences – don’t judge based on them; Do discuss with harmony – don’t be a negative critic; Do listen – the input from others is not going to be there forever.

participants considered that the role-play exercise was the least relevant for developing skills of empathy and communication, as opposed to the 6-8-5 exercise which was the most relevant across dimensions.

Table 1. Descriptive statistics on the impacts on skills acquisition and intention of use.

Variable		N	M	SD	Min	Max
Greater level of empathy	Role play	15	5.00	1.37	2	7
	Boat Exercise	15	5.07	1.44	3	7
	6-8-5 Exercise	14	5.21	1.01	3	6
	All exercise together	14	5.50	1.18	3	7
Facilitated communication	Role play	16	5.00	1.32	2	7
	Boat Exercise	16	5.25	1.09	3	7
	6-8-5 Exercise	14	5.57	0.90	4	7
	All exercise together	16	5.81	0.88	4	7
Openness to employing co-design	Role play	16	5.56	1.58	2	7
	Boat Exercise	16	5.56	1.46	2	7
	6-8-5 Exercise	15	5.73	1.39	2	7
	All exercise together	15	5.87	1.31	2	7

Legend: N= number of participants who answered; M= mean; SD=Standard deviation; Min= minimum; Max=maximum

5.2 Applicability and Learning Effectiveness

Table 2 shows, regarding the applicability of the different exercises in a real-world context, participants have a positive perception towards their usefulness. Into what concerns the effectiveness of the hands-on and playful nature of the exercises in increasing participant's knowledge on co-design methods, both features seem to be recognized as positive, with its playful nature showing slightly better ratings overall.

Table 2. Descriptive statistics on applicability and effectiveness in learning about co-design.

Variable	N	M	SD	Min	Max
Exercises are easy to apply to real contexts	17	5.20	1.52	3	7
Hands-on approach is effective in increasing knowledge of co-design methods	17	5.41	1.33	3	7
Playful nature is effective in increasing knowledge of co-design methods	17	5.82	1.10	3	7

Legend: N= number of participants who answered; M= mean; SD=Standard deviation; Min= minimum; Max=maximum

6 Discussion

The skills related to empathy and communication are crucial when employing co-design approaches, not only because they facilitate the interaction with others, but also because they are key in allowing design teams to identify and interpret peoples' needs and expectations. Prior research [20, 21] has stressed the importance of understanding how such social and emotional skills could be taught, thus becoming an emerging research area within HCI. The approach proposed in this workshop allows for the development of these skills, through stimulating empathy and communication skills as well as the openness to experimentation in the field. To recognize the value of employing such design approaches is particularly relevant when referring to project coordinators, who are often the one key decision makers in determining what activities to prioritize and which resources to spend in design projects.

In the case of the workshop described in this paper, it seems that the different exercises were complementary in the sense that they enabled for the development of skills crucial for the deeper understanding of the self and the others, addressing the needs highlighted in [14]. In doing so, the awareness of the importance of these types of methods was also developed. Still, the workshop participants did point out that, when carrying out the exercises with older adults, more time was likely to be needed in order to accommodate for any vision, auditory, or memory limitations. Contrasting the three different exercises used during the workshop, the role-play activity is the least valued activity in terms of improving empathy and communication. Arguably, this might be explained due to participants' awareness that, when in a real-world setting, outside a training room, they will indeed be working with actual end-users.

The positive impressions left by the workshop in terms of skills acquisition and intention of use were also observed when participants were inquired about the ease of application of the exercises in a real-world context. On the one hand, participants felt that the workshop was useful to understand the benefits of employing co-design methods, as well as its main characteristics, promoting the openness to its future use. On the other hand, through the hands-on approach followed, it was possible for participants to experience their playful nature. Playfulness is important in fostering motivation, involvement and fun, and thus central in the process of knowledge acquisition [22]. This again supports the idea that it is beneficial to run these types of workshops with multidisciplinary teams.

7 Conclusions and Future Work

In the form of an exploratory case study, this paper contributes a set of activities, here presented in the form of a workshop, to train multidisciplinary teams in co-design methods. Each of the exercises is described as well as the remaining procedures to allow for its future replication. Seventeen project coordinators were consulted to assess the value of the approach followed in terms of skill acquisition, intention of use, applicability, and learning effectiveness. Results show an overall positive opinion towards the approach, with participants recognizing it improved empathy and com-

munication and increased their openness to employ co-design methods. The opinions also indicate the playfulness is valued when it comes the learning effectiveness. As an exploratory study, with a relatively small sample, the study allows for limited extrapolation and can be seen as a first-step to conduct more detailed inquiries into co-design awareness and usage in the future. Regardless of the limitations, results are encouraging and indicate that workshops like this may indeed raise the required awareness on the necessity of engaging end-users through participatory approaches, if we are to design products and services that suit user needs and lifestyles. The contributions of this paper have implications for both researchers and practitioners working in the field. Not only does the paper provide the community with a replicable training tool, as the results have also indicated that the approach followed allowed for the development of the, much needed in design, social and emotional skills.

Acknowledgements

This research was developed with the support of the Research Program “CeNTER - Community-led Territorial Innovation” (CENTRO-01-0145-FEDER- 000002), funded by Programa Operacional Regional do Centro (CENTRO 2020), PT2020. We would also like to express our gratitude to the workshop participants and to Phil Jordan, University of Hawai’i Manoa, for the suggestions on the manuscript.

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