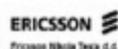




Case studies on Inclusive Innovation: Engaging hard-to-reach target groups

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Topline findings

- Inclusive Innovation enriches your innovation process!
- There are a bunch of practical tips how to get started.
- Co-creating with low-income families: Innovative methods generate innovative ideas. Creative and iterative methods for families reveal amazing things that benefit everyone.
- Co-creating with blind and visually impaired people: Innovate with the people, not for them.



Who we are

We, the authors of this handout, were partners of the research initiative Living Innovation (LIV_IN; www.living-innovation.net). Funded by the European Commission, LIV_IN aimed to develop responsible smart home and smart health solutions that tackle societal challenges and respond to pressing societal trends. The initiative involved industry leaders that engaged with lay people in co-creation processes to create solutions that meet user needs and leverage collective creativity to uncover new business ideas. Challenges and opportunities of involving citizens in developing innovations were demonstrated in 2019 and 2020 in about twenty co-creation workshops as part of the LIV_IN project. By directly engaging users and by working together in these workshops, both industry and citizens learned from each other for the benefit of better innovations.

At this point, we need to raise your attention for the LIV_IN understanding of innovation since we aimed to go beyond "normal" innovations for "normal" people. Rather, our approach was to explore the advantages of new smart technologies for those often not at the center when it comes to develop innovations, i.e. impaired persons and deprived social groups. So, what we did in LIV_IN was to co-create *Inclusive Innovations* with and for those people. In the next chapter, we will explain why you might be interested in learning about Inclusive Innovation. Before diving deeper into this topic, however, you might also be interested to get to know what empowers us to publish a handout on Inclusive Innovation.

DIALOGIK is one of the leading German non-profit research institutes regarding engagement and participation. DIALOGIK provides knowledge and expertise to all interested parties and makes its research results public. In the LIV_IN project DIALOGIK was responsible for designing the co-creation workshops, and for providing a toolkit with methods for co-creation workshops.

De Montfort University (DMU) is a leading research-oriented University in the UK with approximately 20,500 students. Its Centre for Computing and Social Responsibility (CCSR) is the largest research centre of its kind in the UK and one of few in Europe and the world. DMU led the LIV_IN lab on "High tech at home" on the question of "How will high tech and robotics shape our home experience in the future", including co-creation workshops. Furthermore, DMU created a Community Building Handbook and was responsible for outreach to industries and stakeholders.

The Siemens Accessibility Competence Center (ACC) is a Siemens department providing consultancy, testing and training for the accessibility of ICT products and solutions. The ACC led the LIV_IN lab on "Life-long Health & Care" including co-creation workshops on the question "How can new technologies enhance our entire life?", involving very diverse groups of persons with reduced abilities.

Why Inclusive Innovation?



"THE SIMPLEST ANSWER IS ALSO THE MOST NATURAL: SO THAT YOU HAVE PRODUCTS THAT ALSO HELP THE USERS."
(KLAUS-PETER WEGGE, SIEMENS)

Why Inclusive Innovation? The answer is simple: Because it can enrich your innovation process! Although it may not be obvious to you, there is an urging need for Inclusive Innovation. Not only is the number of people with visual, hearing or mobility impairments increasing in ageing societies. According to the World Bank, about 15 % of the world's population experience some form of disability. To express it in total numbers: in a population of roughly one billion people, of them between 110 million and 190 million of them will have disabilities¹. However, this is just one side of the coin. When it comes to Inclusive Innovation, there is a second strand of people frequently excluded from opportunities available. Here, we talk about the needs of socio-economically less advantaged people. Evidence from Asia, for instance, suggest that enlarging "participatory opportunities for those who are otherwise economically marginalized through new products and services"² has become a key factor driving the region's rapid economic and social progress.

From a simple business perspective, Inclusive Innovation points to the market potential of involving the needs of physically and socially weak people into product and service development. However, it is not all about profit. True Inclusive Innovation is also in line with the principles of Responsible Research and Innovation (RRI). RRI demands participation of citizens and stakeholders and making sustainability and ethics integral to parts of the innovation process³.

This handout provides successful examples of Inclusive Innovation processes and practical tips for successful implementation.

Inclusive Innovation seeks to provide sustainable solutions to those who would otherwise remain excluded from access to offers as a result of their physical, mental, social, economic or environmental context. As an activity and business model, it reconciles the goals of commercial viability with sustainable societal development.⁴

¹ Lee, B. Y. (2016). An Overlooked and Growing Market: People with Disabilities. <https://www.forbes.com/sites/brucelee/2016/11/02/an-overlooked-and-growing-market-people-with-disabilities/#61103f4a2ab0>. Accessed: July 12, 2021.

² Bertelsmann-Stiftung (2019). Inclusive Innovation Atlas. Gütersloh. https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/FINAL_BST_Inclusive_Innovation_Atlas_09_09_2019.pdf. Accessed: July 12, 2021.

³ von Schomberg, R. (2013). A Vision of Responsible Research and Innovation. In: Owen, R.; Bessant, J.; & Heintz, M. (eds.): Responsible Innovation. London: Wiley, pp. 51-74.

⁴ Bertelsmann-Stiftung (2019) (cf. Footnote 2), slightly changed by the handout authors.

DMU case study: Inclusive Innovation with low-income families



"WE WANTED TO LEARN HOW TO ENGAGE PEOPLE WITH LOW INCOME, HIGH DEPRIVATION AREAS, AND TO UNDERSTAND WHERE ARE THEY COMING FROM. FOR ME IT WAS ONE OF THE MOST SATISFYING PIECE OF RESEARCH."
(CATHRINE FLICK, DMU)

The main focus of the DMU labs was on high-tech at home for socio-economically less advantaged families from a socially deprived part of a large UK city. The main questions were what problems in the home do the participants think there might be technical solutions for and what they imagine future technologies in home might look like in 2030. The workshop was also following the questions:

- How do we change practice?
- What can we learn and take back to the companies?
- What are pinpoint aspects of how the people work and how people think about technology?

The focus of these questions continued to be on how to ensure that the technology is also responsible, e.g., according to the criteria of regulation, accessibility, sustainability etc. To answer these questions, a series of workshops was held with families. In a second step, interviews were conducted with cutting edge technology professionals.

Invitation Process

The recruitment process took place through several channels:

- DMU local (volunteering for communities)
- Facebook
- Artist
- Local radio broadcast
- WhatsApp channels in mum groups in Leicester (1000 mums) via a multiplier.

The WhatsApp chats and Facebook groups were the most successful approach with 20 sign ups, of which 12 sent their consent forms back and participated in the whole process. In this case, personal networks have proved to be the successful way to integrate families.

Methods

The approach was called “Design Thinking light approach” by the implementers, which followed specific steps:

- The first step for the families was to consider what problem they had and to portray it in a picture.
- Then they switched their idea with another family, and they drew the solution to the others family’s problem with a futuristic technology they could imagine.
- The original family got the picture back and modified it, if they liked the approach, and if not, they developed an alternative.

After this process, all artworks were exhibited in the virtual art gallery and interviews were conducted with all participants. These interviews were conducted through an online call with one family at a time. The aim of these interviews was to make sure to understand the drawn problem in detail and the solutions depicted in the art pieces. Focussing on the visions by the families, the interview focussed the results of the main methodological steps of the workshop series: problem, solution and modification.

The process was designed asynchronously so that the methods could be applied independently by the families. This meant that the families could complete their tasks when it best suited their daily routine. This asynchronised nature of the process made it possible to create as much flexibility as possible for the participants, thus making it easier for them to participate.

Key factors of the process were:

- Provide an interesting activity for the participants.
- Leave the participants enough time to do their drawings.
- Constant reminders because of the asynchronous nature of the process.
- Families liked the format as a joint activity for the whole family
- Think about the tools people might have at home, and don’t acquire anything expensive.
- In some cases, the incentive was important (shopping voucher).
- The pandemic lockdown also helped with recruitment and completing the activities as the families had little else to do

Results

The workshops showed how exciting a targeted involvement of whole families in the innovation process can be and how it is a win-win for everyone involved. The families felt heard, but more importantly they were encouraged to think creatively and have fun together. Outreach participation can contribute to a good feeling on all sides as long as it is not forced and offers added value for the participants. Ideas and concepts could thus be identified for the innovation process.

The artworks provided a large amount of input and suggestions, which could be further deepened through the interviews with the families and technology professionals.

Example of a problem and its solution



PROBLEM: RECYCLING IN THE HOME

Garbage and recycling builds up in the home and pollutes the environment.



SOLUTION: ROBOWASTE-CYCLER

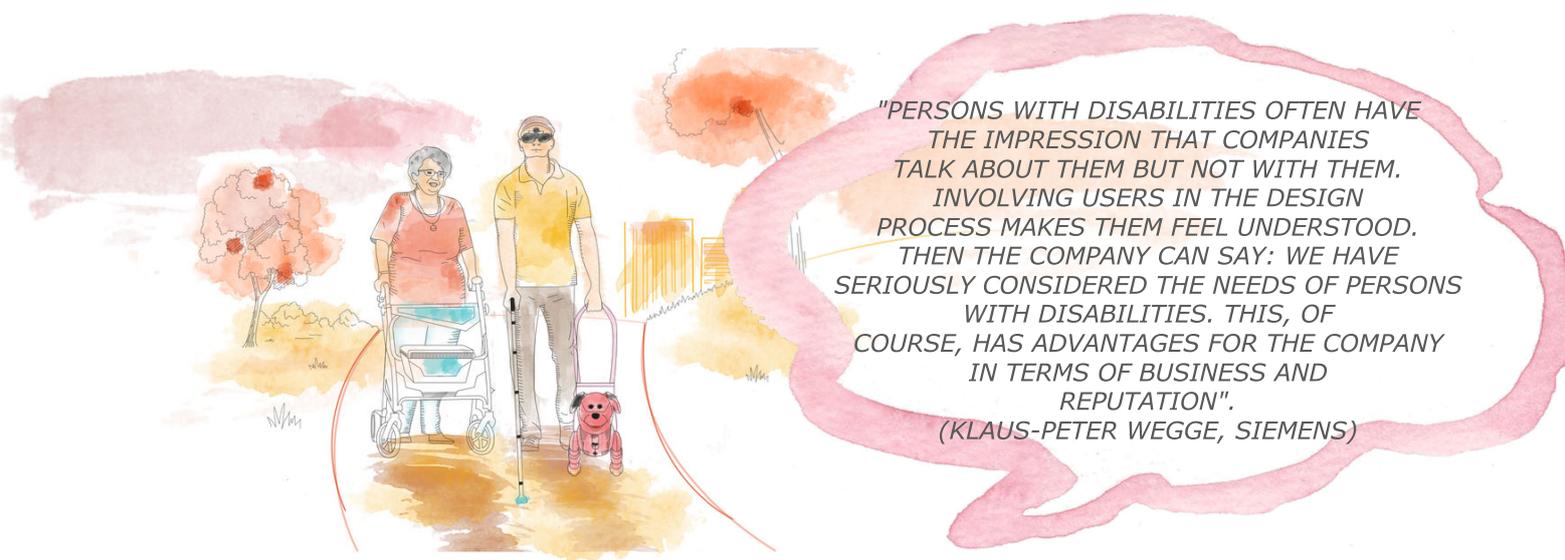
The RoboWaste-Cycler intelligently separates waste generated at home into recyclable and non-recyclable categories. It processes the non-recyclable waste into slabs that could serve as organic manure at farms and refines the recyclable category into slabs that can be used as raw materials at factories. It then delivers the processed waste slabs to farm and industry sites.



MODIFIED: USE SLABS AT HOME

This modification allows the slabs of recycled/non-recycled materials to be able to be used in the local area as well, such as at home.

Siemens case study: Inclusive Innovation with blind and visually impaired people



"PERSONS WITH DISABILITIES OFTEN HAVE THE IMPRESSION THAT COMPANIES TALK ABOUT THEM BUT NOT WITH THEM. INVOLVING USERS IN THE DESIGN PROCESS MAKES THEM FEEL UNDERSTOOD. THEN THE COMPANY CAN SAY: WE HAVE SERIOUSLY CONSIDERED THE NEEDS OF PERSONS WITH DISABILITIES. THIS, OF COURSE, HAS ADVANTAGES FOR THE COMPANY IN TERMS OF BUSINESS AND REPUTATION".
(KLAUS-PETER WEGGE, SIEMENS)

On invitation of the Siemens Accessibility Competence Center (ACC), on September 21, 2019 a group of 20 people came together in Saulgrub (Germany) to jointly discuss the question "How do we want to live in 2030". The overall intention was to co-create non-intrusive, non-stigmatizing and affordable technologies that could enhance their daily lives, so a mix of blind and visually impaired people set up the group. Since the participants belonged to the special interest group of radio amateurs, the workshop focused particularly on developing an amateur radio device which meets the requirements of blind and low vision users. All participants are active members in the German "Interest group of blind radio amateurs" (IbFD) and most of them already knew each other before due to their engagement in this association and their daily communication via amateur radio. Due to the ICT affinity of the participants, it was possible to go beyond look and feel issues and to talk even about technical details of an improved amateur radio transceiver usable for blind and visually impaired people.

Invitation Process

In order to save travel and accommodation cost and to make it as comfortable as possible for participants to join the workshop, it was combined with a regular IbFD meeting. Because of this approach, the recruitment of the participants was kindly organized by the IbFD. The association distributed the invitation by audio book 12 weeks before the workshop among all 93 IbFD members.

Using the same communication channel, 2 weeks before the event the informed consent and workshop material was shared. Finally, 20 people (14 men, 6 women) attended the IbFD meeting and all of them participated in the workshop, consisting of 15 blind and 5 people with low vision.

Location

The workshop took place in the Aura hotel (Saulgrub, Germany) which is specifically designed for blind and persons with low vision. It is completely barrier-free. For example all rooms are labelled with Braille and tactile large print and can be found independently without any help by guests due to guiding stripes on the floor. Most of the participants were already familiar with the location from previous visits. The Aura hotel is well known by radio operators because it offers the use of a completely accessible amateur radio station in the hotel.



Facilitation

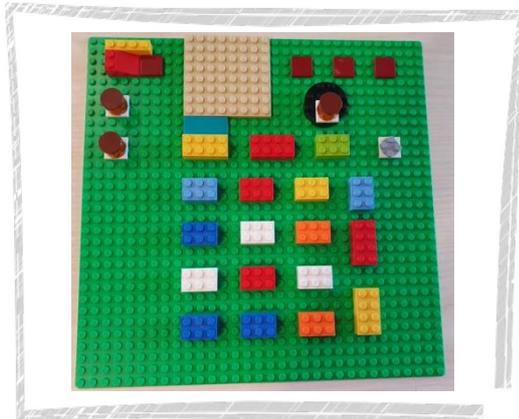
The specific composition of the workshop attendees fostered us to pay extra attention to facilitation issues. First, we decided that facilitation needs to be done by more than one moderator and a single supporter. Thus, we set up a team of 5, consisting of a head moderator, a co-moderator, and 3 assistants. Second, since the workshop was attended by people with low vision or no vision, it was difficult to assess in advance what degree of disability and what abilities the participants have. So, it was not clear from the beginning whether all participants could read Braille or whether some of them were unfamiliar with Braille. We found it not adequate to ask for such characteristics in the invitation. For that reason, we had to select suitable facilitation formats in advance to be able to provide tailored support for the participants:

- The informed consent and the workshop agenda were presented in hybrid form, i.e. large print and Braille simultaneously as well as in audio format.
- The facilitation team offered assistance during all phases of the workshop. In addition, the participants were able to work in groups thus they could help each other.
- The facilitators paid special attention that everything presented visually also was explained verbally. Thus the content was comprehensible without seeing the presentation. For instance, while a video was being played, a facilitator interrupted the video to explain relevant points that are not self-explanatory through the audio track.
- Name badges were prepared so that facilitators were able to address the participants by name.

More tips and hints on an affordable facilitation are provided in the LIV_IN document "Seven practical points for facilitating workshops with blind and visually impaired people"⁵.

⁵ This document is part of our Knowledge Units. To download it, please register on the project homepage without any obligation: www.living-innovation.net

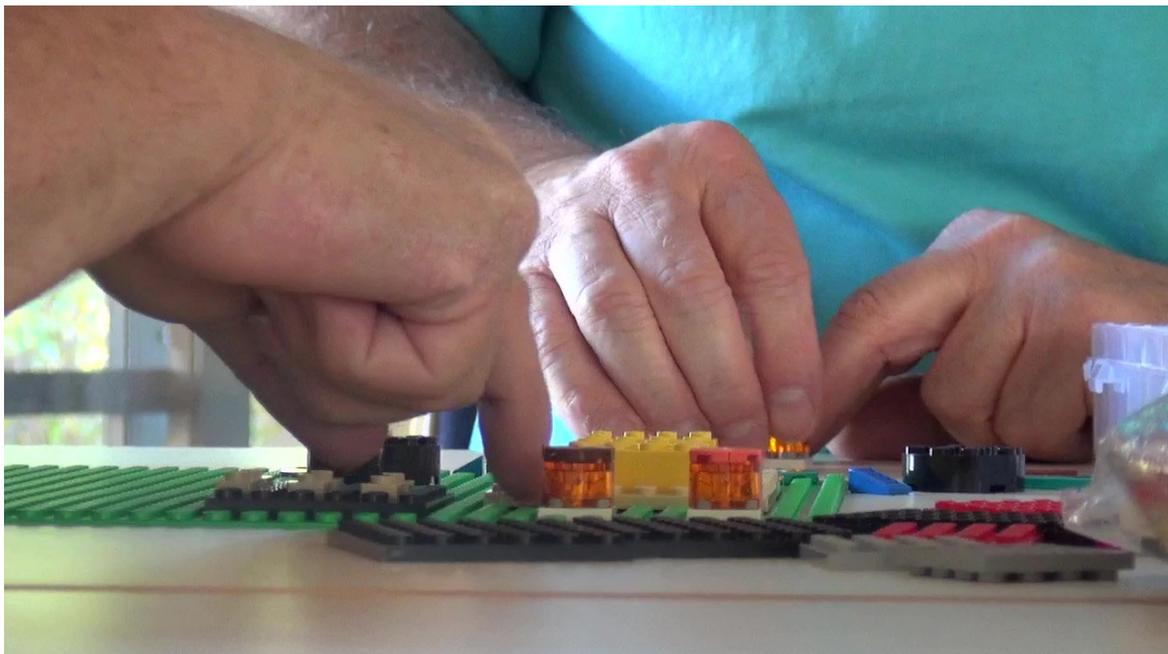
Methods



In terms of methods used, the workshop's discussions and co-creation activities are to be depicted in two respects: Structured brainstorming and Lego haptic experience. Structured brainstorming was used to identify problems and challenges that occur for blind and low vision persons in the areas of quality of life and health. For applying this method in a motivating manner, we worked out checklists providing guidance and a list of 15 possible topics such as use of multimedia, loneliness, fitness, or electronic patient file. To avoid duplication of top-

ics, we set up breakout groups and asked each team to select at least one topic to work on. Each group was assigned an assistant from the facilitator team that noted key points during the working phase.

For the second part of the workshop, the structured brainstorming method appeared not to be useable. Here participants were asked to design an amateur radio transceiver that is adapted to the needs of blind and visually impaired people. In order to illustrate the design wishes of the participants, Lego bricks were provided. The participants were divided into groups and each group had the task of creating one Lego model. So, we used Lego as a haptic experience, where it was not about outward appearances like colours, but about the pure haptic functionality that the bricks represent. In order to save time, we selected suitable bricks and put them into an assortment box for each group. We created our own selection as it turned out that for the workshop participants the classic Lego Serious Play sets, often used for user experience workshops, are not adequate.



Results

The outcomes of the workshop, on the one hand, underline the urgent requirement of the participants for ICT products and applications that are from the very beginning designed also for the needs of blind and low-vision persons. Participants' requests reflect the fact that this is far from being the case, be it in consumer electronics, digital photography, health, or fitness. So, requests were raised for smart TV sets that provide speech input and output for all and not only a few functions, digital cameras with voice guidance and voice assistance, indoor navigation in hospitals and medical offices, or accessible mobile apps for fitness.

The results of the Lego experiment, on the other hand, demonstrate the potential of involving users in innovation processes. Provided with the task to identify inclusive design features of an amateur radio device, a wide range of proposals emerged, among others:

- well-structured menu navigation with countable items, no circular lists, confirmation beeps,
- touch operation with speech support (different actions for item selection and activation),
- mechanical buttons and knobs which are easily perceivable by touch for blind and low-vision people,
- large displays, adjustable colour contrast and large font size.

The general consensus of the group was the application of the Design for All approach for addressing the needs of all people including blind and visually impaired. This concept allows an inclusive practice of a hobby.

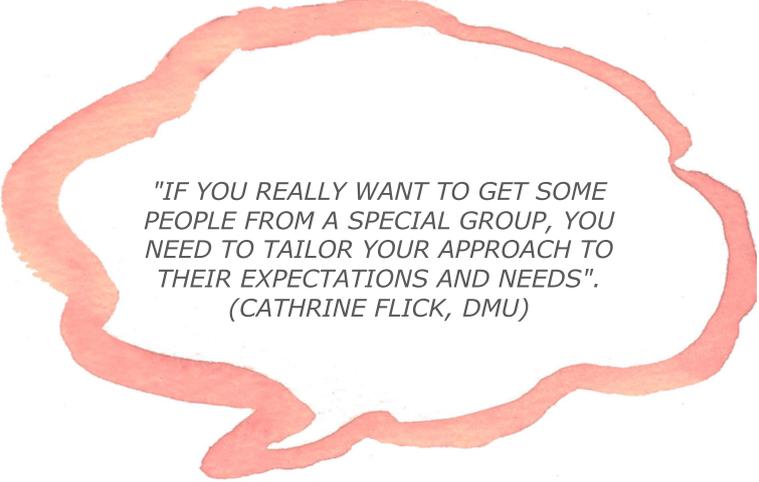
Practical tips to successfully perform Inclusive Innovation



Get started with the main question: What goal do I pursue? Involvement can have different objectives, ranging from information to collecting ideas and opinion polling to advise-seeking and co-creation. It should be clear for the process owners what the goal is, because the goal of the process strongly influences the selection of participants, suitable methods, timelines, etc. For more details feel free to check out the Co-Creation Toolkit⁶.

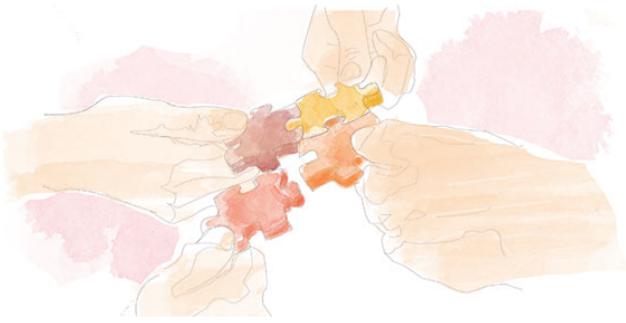
INVITATION PROCESS

- Define selection criteria for the recruitment process.
- Think about ways how to approach your target group. This can successfully be done by networks or multipliers, e.g. self-help groups, patient representatives or neighbourhood associations.
- Think about an incentive. You want to know something from the audience. A financial incentive can also be used so that the single mother or father, for example, can afford a babysitter for the time and thus participate.
- Use a variety of channels, e.g. Facebook, radio broadcast, artists, etc.
- If you have a personal network, use it.
- There is no difference between online or offline recruitment.



*"IF YOU REALLY WANT TO GET SOME PEOPLE FROM A SPECIAL GROUP, YOU NEED TO TAILOR YOUR APPROACH TO THEIR EXPECTATIONS AND NEEDS".
(CATHRINE FLICK, DMU)*

⁶ You can download the toolkit here: <https://www.living-innovation.net/news/article?id=212&title=new-toolkit-for-effective-co-creation>



LOCATION

- The possible restrictions of the participants require that the location is chosen carefully.
- It should be a familiar and accessible location. There should also be good freedom of movement in the room itself.
- The event location should be in the immediate vicinity of the participants' homes. Ideally, the participants already know the location.
- For visually and hearing impaired people, make sure that the acoustics of the event room are good.

ONLINE TOOLS

If you are planning your workshop as an online format, there are some things to consider here as well.

- The software used should be free of charge.
- Data protection for the participants must be guaranteed.
- Bear in mind that a lot of software is not usable for blind people. Inform yourself in advance. A telephone conference could be the tool of choice here.
- When using online tools, plan enough time for all participants to familiarise themselves with the technique. Here, an extra appointment can help to bring everyone up to speed.
- Technical support and interaction are somewhat more difficult in online formats. Setting up extra technical support for the workshop can be a great help here.



*"IT WAS SO MUCH MORE INVOLVEMENT THAN JUST RUNNING A FOCUS GROUP. THE WORKSHOP PROCESS FORMED AN ACTIVE COMMUNITY, THAN IT WAS JUST INFORMATION FROM A RESEARCH PROJECT TO THE PARTICIPANTS".
(CATHRINE FLICK, DMU)*

FACILITATION

- Ideally, find a facilitator who is familiar with working with the target group.
- A professional facilitator can ask the right questions to provide a constructive and creative working flow and will ensure that everybody has the opportunity to participate.
- A facilitator can also help designing the workshop and ensures a target-oriented and effective process.

Examples of methods to be used for Inclusive Innovations



Role Playing/Empathy Map/Customer Journey/Personas

These methods help to understand how different users would possibly act in the same situation and which functionalities of the product are needed or missing.

Walt Disney Method/Six Thinking Hats

Walt Disney: An issue is discussed out of 3 perspectives: dreamer, realist & critic

Thinking Hats: In a group of 6 persons, each tries to argue in a specific way of thinking: facts, emotions, logic, creativity, judgement/caution and control.



Card Sort

Participants name possible features, functions or design attributes on separate cards and are asked to organize them spatially in a way that makes sense to them.

Narration

When executing a specific task related to a product, participants are asked to describe aloud what they are thinking.



Mind Mapping/Flower of Thoughts

These methods give an overview of ideas and a common knowledge base about complex subjects. Similar to mind-mapping, 'the flower of thoughts' is usually created in group work. Each association becomes a 'petal' of a flower.

(Structured) Brainstorming/Brain Writing/Future Wheel

Brainstorming can be described as collecting a quantity of (diverse) ideas, following a structured, turn-based framework. Brain Writing is brainstorming in written form.



Rough Prototyping

It is a quick method to build prototypes using all the objects and material available in that specific moment and location.

This tool supports the visualization of ideas and aims to assure that all workshop members are talking about the same thing. It contributes to make the design process more interactive and concrete.



ONLINE TECHNOLOGY FOR PEOPLE WITH VISUAL OR HEARING IMPAIRMENT

- *Magnification* or *Synthetic Speech* for converting online information from text to audio for blind people. Some may prefer the use their refreshable Braille display.
- *AVA* or *Google Live Transcribe* for deaf people or people with hearing impairment (spoken text will be appearing in the installed transcription app).
- *Rogervoice* produces live transcriptions during phone calls.

TOOLS FOR ONLINE PARTICIPATION

- Video conferencing tools (e.g. *Zoom*, *Microsoft Teams*, *Jitsi Meets*).
- *Creatlr* to organize information.
- *Typeform* for ready-made templates.
- *Smply*, *Useforage* and *MakeMyPersona* for creating “personas” online.
- *SessionLab*, *Conceptboard* and *Ideaflip* for brainstorming.
- *BORDS*, *POP* or *Mockingbird* for drawing, and to share sketches (storyboards).

For further information, the compendium of results of the workshops and knowledge unites, please visit the LIVING INNOVATION website:



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