

# Redesigning a Workshop from Physical to Digital: Principles for Designing Distributed Co-design Approaches

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## Abstract

This paper presents a case study of a redesign of a physical workshop into a virtual one to illustrate the application of a set of principles for designing and running co-design online events. Such workshops require a different co-design approach to overcome the challenges of working in spatially distributed settings, such as the lack of audiovisual cues, digital skills and physical presence. This approach involves developing a new design 'language' that a community can understand and use in engagement projects. In this paper, we present a set of principles for planning and facilitating online events, and designing interactive resources, and the application of such principles in a redesign process of a conference workshop. The findings from the case study suggest that short-term activities and active facilitation assisted by a technical producer can support the delivery of effective online workshops, enabling participants to achieve desired outcomes in a timely manner.

**Keywords:** Distributed co-design, online workshops, virtual events, creative engagement, design principles.

## Introduction

In co-design, anyone interested in doing more creative consultations can design collaborative spaces and facilitate events to include communities in decision-making processes, where professional designers may or may not be involved in the engagement project (Zamenopoulos & Alexiou, 2018). In this open design perspective, people use methods, techniques, and tools to engage with those involved in co-design projects to produce new knowledge around a matter of concern. In face-to-face interactions, people communicate through a conscious or unconscious paralanguage, which includes facial expressions, body language, pitch, volume, and speech intonation (Clubb, 2007). In physical workshops, these interactions happen in a specific time and space and can be assisted by tools that enable creative exchange between participants that goes

beyond paralanguage. However, due to the covid-19 outbreak, there has been a shift from in-person workshops toward online approaches that uses platforms and tools to support community engagement in the era of physical distancing. Designing these types of Human-to-Computer-to-Human Interactions requires a different co-design approach, where people work in a process that can be spatially and temporally distributed over the Internet. This does not mean a translation or replication of physical workshops (Näkki & Antikainen, 2008), but rather an understanding of a new design 'language' that participants can understand and use for exchanging knowledge among themselves.

Although video conferencing technologies are increasingly available (e.g. Zoom, Google meet), understanding the grammar of technologies, loss of part of paralanguage, and absence physical presence remain the main challenges of working in online settings. Designing engaging interactions is a way to support mutual learning processes of people involved in co-design projects through the support of mediating technologies. This can involve designing engagement activities, creative facilitation approaches and appropriation of existing technologies to enable participants to exchange ideas, expertise, and experiences to achieve desired outcomes. In this paper, we propose a set of principles for designing and running workshops in digital environments and test it in practice through a redesign of a physical workshop to address the research question: **How can physical workshops be conducted in online settings?** This paper describes a case study, where we used the set of principles to redesign and deliver a conference workshop to DRS2020 delegates. The workshop 'Designing Research Ecosystems' aimed at enhancing the understanding of research ecosystems, where participants agreed on criteria for successful ecosystems, identified contacts, created a visualisation of their networks, and drew insights and discuss how to activate sustain these insights. This study provides insights into the role of an expert in creative interactions, the

skills required for facilitation in virtual environments, and future research on distributed co-design.

## Our Distributed Co-design approach

This project called DisCo (Distributed Co-design) is part of a £13.2 million 3-year project that will provide fresh perspectives on real-world challenges. As part of our co-design and practice-based research philosophy, we work closely with design practitioners and communities in devising desired outcomes. However, to ensure completion of existing research projects in a timely manner during the covid-19 pandemic, we designed and ran pilot studies to develop principles to work collaboratively in virtual environments. These principles draw on design theories and practices, including creative facilitation (Tassoul, 2009), open design (Cruickshank, 2014), participatory design (Simonsen & Robertson, 2013), co-design (Zamenopoulos & Alexiou, 2018), and interaction design principles, such as employing short-term activities to reduce information overload, keeping things simple, and providing clear instructions. In the following section, we present a set of principles for distributed co-design, where we adapted our improvement framework used for redesigning engagement tools (Galabo & Cruickshank, 2019) to cluster the principles in three co-design layers of practice: Planning and Facilitating online events, and Designing interactive resources.

## PLANNING ONLINE EVENTS

Planning engagement events involves considering the audience, platform, aims and objectives, and actions used for engaging with a community of experts, potential users or beneficiaries of co-design outputs. The role of designers in planning an open design space is to frame contextual challenges into a co-design process, enabling participants to exchange ideas and expertise in order to achieve an agreed objective.

## Define the appropriate co-design approach.

The first stage involves thinking about the people attending an online event (the number of participants), their technical limitations (e.g. access to internet, levels of digital literacy, familiarity to the platforms used), and setting requirements beforehand (e.g. smart phone or computer). The analysis of these factors will determine the platforms to be used and the level of adaptation or appropriation of the technologies. For instance, if participants have issues to access Internet, the co-design approach could involve the use of phone call and text or voice messages. In this way the event could go 'low-tech' avoiding broadband issues. Another option is to work in different times by using a combination of interactions in asynchronous events. A digital platform and a set of interactions should remind participants about their earlier experiences to enable them to work in an appropriate way. This approach involves a pragmatic participatory design theory that features Wittgenstein philosophy (1922), where a specific design language game resembles professionals' practice is applied in design-by-doing processes.

## Plan short-term activities to reduce information overload.

The attention span of participants and skills required in online workshops are not the same as in physical workshops. When participants attend physical workshops, they can focus on a hands-on task using basic analogue tools (e.g. pen and paper) with fewer distractions around the activity and in the environment. In online workshops, participants with different digital literacy have to use tools that might not be familiar to them, and also have potential distractions of incoming texts, notification sounds and pop-ups, and external stimuli of participants' environment during an interactive activity.

Planning short-term activities can make participants feel more comfortable about the virtual environment and less worried, concerned and pressured to achieve similar outcomes as in physical workshops. Devising a distributed multiple light touch over a day or week could enable a better way to keep participants engaged in a workshop, such as designing a series of five 1-hour online events. This change in process requires not only reducing the workshop duration, but also the time spent in each interactive task.

## Get beyond the screen.

Designing activities that make people move around can introduce physical activities and provide fun. Icebreakers are often used to start a session and get people to talk, providing a more human connection in an online event. For example, facilitators can ask participants to find objects related to the topic of the workshop to warm them up for further activities, encourage people to talk and learn basic interactions, such as turning on/off microphones and video.

## DESIGNING INTERACTIVE RESOURCES

Designing interactive resources is similar to creating tools to assist participants and facilitators to run physical workshops, such as proformas, worksheets or templates. Tools support techniques and skills (e.g. discuss, type, react, drag and drop), enabling participants to share knowledge and ideas through telling, making and enacting activities (Brandt et al., 2012). In online workshops, these tools can be a set of icons, boxes and emojis on a virtual whiteboard or platform.

## Think about what interactions are needed to enable creative exchange.

The type of interactions affects the flow of the event. Introducing many new techniques in online events can overwhelm participants, requiring extra time to allow them to familiarise with the platform and respond to tasks. Breaking down engaging interactions into small tasks in different windows/spaces can help participants in making sense of activities. Another suggestion is to assign participants into small groups to reduce the number of interactions on their screen. For example, facilitators could instruct participants to use video only for discussion and ask the group to agree on who will do what when generating inputs to avoid confusion.

## Design simple activities with tools for remote teams (e.g. google docs, Miro).

Limiting instructions simple actions, such as listing, sorting, and highlighting help participants to respond to interactive tasks. Make sure these instructions are visible to participants when they are responding to a task, such as a bold heading or a programme guide. A programme guide helps to reduce anxiety towards the completion of the task and use of technology. For instance, Miro and Mural have a sidebar showing the steps to be taken on a task. A facilitator in each breakout room might be required to assure participants are doing right.

## FACILITATING ONLINE EVENTS

Facilitating engagement events involves implementing the plan within an open design space, where a team of facilitators make sure everyone can contribute to a co-design event, enabling participants to share their experiences and ideas in a creative way. In virtual environments, the role of facilitator is to draw participants into design processes where online mechanisms (e.g. reactions, prompts, tools) are often adopted to assist the delivery of engaging interactive activities.

### Assign co-facilitator roles to team members (Wing person and technical producer).

In physical workshops, a wing person is the one who gives support to the main facilitator, making sure participants understand a task and do it right. They might also be taking pictures, handing over proformas, and observe the session as an outsider. In online workshops, a technical producer or director is the one who creates interactive mechanisms to support virtual sessions, making sure all the digital infrastructure and materials are ready to deploy and assist the main facilitator. They can plan events to work over a day or a week to support participants in co-designing desired outputs that might not require an active facilitation. For instance, a wing person could keep the flow and engagement of participants between transitions, such as between icebreakers and tasks, whilst a technical producer prepares the stage for facilitation. A backup messenger group can support the communication between the main facilitator and co-facilitators.

### Role-play the planned ideas

This process is similar to designing a creative facilitation approach for an in-person workshop, where an iterative process of planning, prototyping and testing a session would support the improvement of the overall workshop (Cruickshank, 2014). Running through the session helps to identify the technical nuances and issues that might happen during the event. When testing an online event, inviting participants with the appropriate level of digital literacy can help identifying things that could go wrong. For example, ask your colleagues to do the workshop tasks and

We tested these principles through an interactive workshop at the DRS2020, where we redesigned a physical workshop to be delivered into a virtual platform. The workshop was originally planned to be conducted at Griffith University in Brisbane Australia, but it had to be moved to a virtual space. The following section details a case study, presenting our approach to re-

sign online approaches that engage participants through a distributed co-design event.

### Case study: Designing Research Ecosystems at the DRS2020

Researchers, just like business enterprises (Adner & Feiler, 2019; Iansiti, 2004), are faced with challenges of understanding interrelationships with their diverse ecosystem actors. Consequently, identifying key factors and actors shaping ecosystems is paramount, this is buttressed in (Pankov et al., 2019), who identify how contextual factors may influence interconnections i.e. exchange of resources between ecosystem stakeholders. Since researchers are all increasingly becoming part of a complex interconnected research milieu, having a deep sense of positions and roles within this complex may aid better understanding of research ecosystem opportunities. Designing 'researcher' ecosystems workshop aimed to enhance the understanding of ecosystem configurations, in order to influence the shape of their ecosystems which often evolve organically (Nthubu et al., 2019). This was achieved using a co-design framework developed and tested for mapping innovation ecosystems.

We adopted the ecosystem design framework (Figure 1), developed through engaging with manufacturing SMEs in both the UK and Botswana. We further reviewed the framework with a group of design researchers with vast experience in co-designing tools at a pilot workshop to ensure the design framework was appropriate for a meaningful application with non-expert designers. Based on the feedback received, the tool was redesigned before use in workshops with 100 participants from a wide range of African organisations e.g. manufacturing SMEs, policymakers, NGOs, researchers and university administrators held in Botswana in February 2020. The visualisation outputs from these workshops formed scaffolds for dialogic design, reflection and decision making, thus according participants a platform to reimagine and shape future forms of innovation ecosystems.

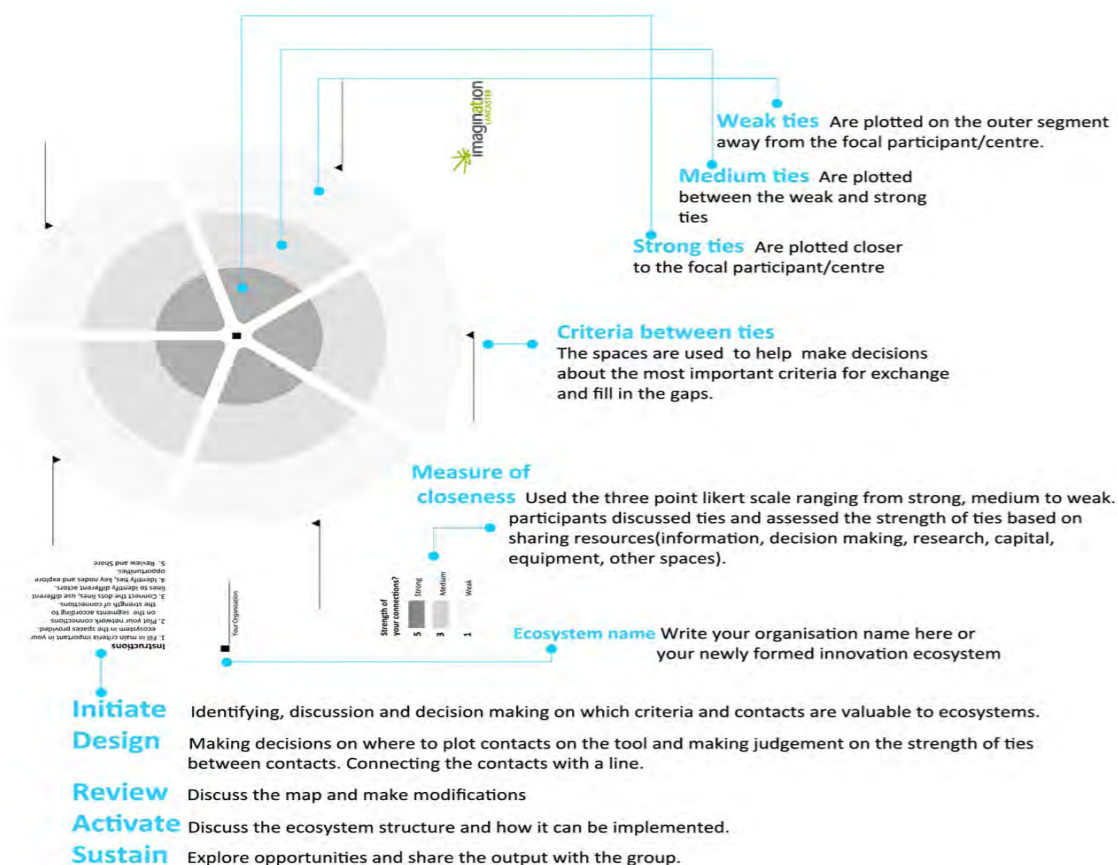


Figure 1. Co-design ecosystem mapping tool

We designed the DRS2020 workshop around the co-design mapping framework to enable participants to initiate, design, review, activate and sustain innovation ecosystems. Initially, we planned the workshop to happen in a physical workshop environment, but it had to be delivered in an online environment due to the new conference requirements. This case study documents the workshop plans (physical and virtual), the redesign process, and the outcomes, which are described in the following sections.

### The physical workshop plan and materials

The initial plan was to conduct the workshop in two parts for 105 minutes, starting with each participant mapping their ecosystems and then later working in groups to combine individual visualisation outputs. We planned to use A3 and A5 paper-based tools for mapping and representing participants in network structures. The workshop materials and plan are described as follows.

#### Part 1: Individual work

**Address ethical issues:** Explain the workshop aim and consent form

**Icebreaker:** Using a design tool (Figure 2: left), participants draw themselves in their network and explain it in 5 seconds to the rest of the group.

**Discussing innovation ecosystem value:** Presentation and discussions lead by the facilitator

**Identifying criteria for ecosystems:** Participants list many criteria for ecosystems and select 5 most important to use on the tool.

**Visualising roles and ties and meaning:** Plot roles and ties on the tool according to the strength of connections. Connect all the points with a line to reveal insights

**Dialogue with other actors:** Share insights about the visualisation outputs through presentations

#### Part 2: Group work

**Identifying criteria for ecosystems:** Participants list many criteria for ecosystems and select 5 most important to use on the tool (Figure 2: right).

**Visualising network roles, ties and meaning:** Using different colours to represent each participant, plot ties on the tool according to the strength of connections.

**Dialogue with other groups:** Share insights about the visualisations through presentations

**Evaluate the tools:** Participants to complete an evaluation form about the tools used, and share suggestions for modifications

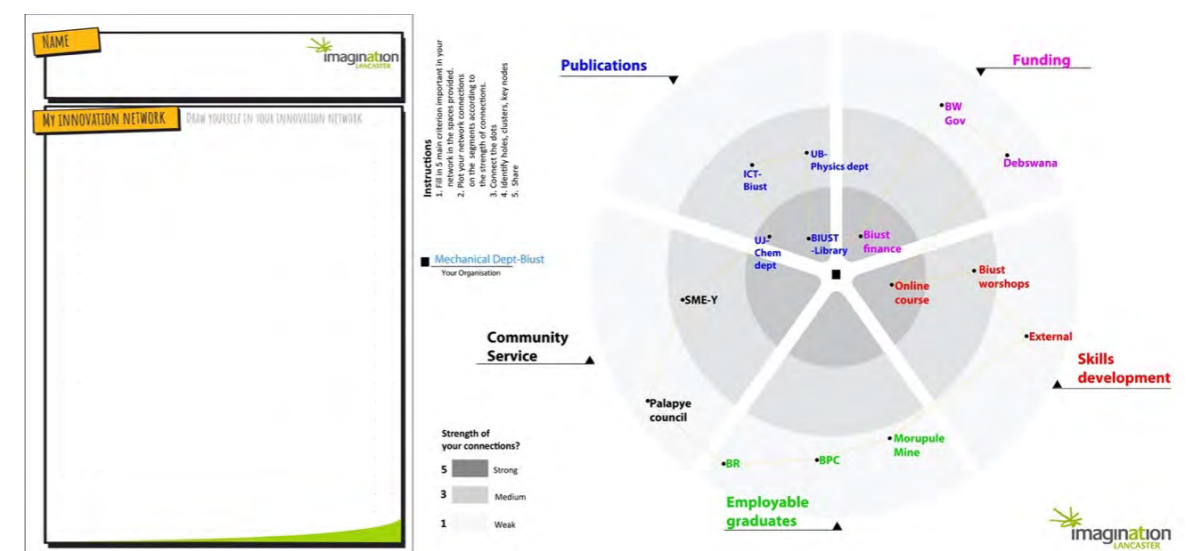


Figure 2. Paper-based tools for representing participants in innovation networks (Left) and mapping group networks (Right)

### Applying the DisCo principles

This section presents how we applied the proposed principles in the redesign of the physical workshops into an online version.

### PLANNING THE ONLINE SESSION

The change in the amount of time allocated to a virtual session was reduced to 60 minutes from the initial 105 minutes, thus affecting the workshop design from the initial two sessions to one. Although the change in time duration was a conference requirement, it was also a way to reduce information overload as the workshop was part of a full-day virtual conference.

We chose to use the MIRO whiteboard to support our online workshop as a popular tool currently used by professional designers and researchers. As other workshops held during the conference also used the platform to exchange knowledge with other participants, it seemed to be an appropriate choice to support our workshop.

Regarding the icebreaker, which normally introduces the concept of ecosystems, we changed it to a virtual activity, where participants were expected to pick any object or 'thing' laying in their physical spaces and talk about that in 10 seconds, and nominate another participant to do the same with the aim to find connections between these things.

### FACILITATING THE ONLINE SESSION

Another disruptive change to the physical workshop was the introduction of a pre-recorded video presentation, where we had to show it at the start of the workshop session as a virtual conference requirement. This requirement added another layer of challenges in redesigning the virtual workshop because it required the mastery of new digital recording skills in a short period. The support of a technical producer, who knew how the mediating technologies operate, made it easier to blend the facilitation skills and technical layer into the co-design process.

Explaining the use of MIRO and Microsoft teams during pre-recording meant that we had to explicitly elaborate the technical language of a virtual environment in a 10 minutes video presentation. This included how participants are expected to navigate between the main session and breakout rooms, explaining the layout of MIRO as a platform i.e. where to find frames to navigate through the design process, where to click and type or copy and paste information, which toolbar to use.

Activity	Design space	Actions
1	<p>1. In 5 minutes, can you list the main criteria in your research ecosystem?</p> <p>*Agree on the most important five, and list below</p>	<p>Click and type in spaces provided</p>
2	<p>2. In 5 minutes, can you list the key contacts in your research ecosystem?</p> <p>*Think about the roles that would make your research successful!</p>	<p>Choose your pad and colour</p> <p>then</p> <p>Click and type in spaces provided</p>
3	<p>3. In 20 minutes, fill in the agreed criteria on the spaces provided and plot contacts on the ecosystem map?</p> <p>*Paying attention to strength of connections between yourself and contacts</p>	<p>Using the same colour from activity 2</p> <p>Copy and past your node icons on the tool</p> <p>Use pen or connection line tools on the left to join nodes</p> <p>Select text tool and type node labels</p>
4	<p>4. In 2 minutes, respond by filling in your colour on the boxes in each question.</p> <p>*Use this nodes</p>	<p>Using the same colour from activities 2&amp; 3</p> <p>Copy and past node icons on the boxes provided to answer the questions</p>

Figure 3. Virtual workshop design spaces

The iterative process of planning, prototyping and running through the session helped to refine the redesigned online workshop. Having the support of a technical producer helped to identify technical issues and things that could go wrong when facilitating an online workshop.

#### DESIGNING INTERACTIVE RESOURCES

Unlike in-person workshops where the planning of design activities involves procuring well-established tools e.g. sticky notes, whiteboards, printed mapping tools, in virtual workshop planning, a lot of time is spent on honing virtual design spaces to lessen the difficulty in using virtual whiteboards and make participants with low digital literacy less worried about learning new skills during interactions.

We broke down the interactions into different spaces to help participants in making sense of activities. The workshop was

limited to four design spaces, with customised icons and tools to ease the co-design activities and lessen the need for high digital literacy (Figure 3). We designed a table with fifteen spaces for participants to fill in their own criteria which include five boxes for participants to agree on five main criteria and fill in the boxes. Participants actions were to click and type in spaces provided as shown in Figure 3(1). We designed Activity-2 in the form of a virtual notepad, again the participants only needed to click and type in their key contacts in the spaces provided. Activity-3 was the main mapping tool space, we provided participants with node icons to copy and paste on the co-design tool, connection line tools to connect nodes, and a text tool on the left to type in their labels. They also had an option to use sticky notes to add reviews. In Activity-4, we use a combination of questions, node icons, boxes and emojis, since people are much familiar with emojis from the realm of the social media, we thought it would be more interesting to use them. Partici-

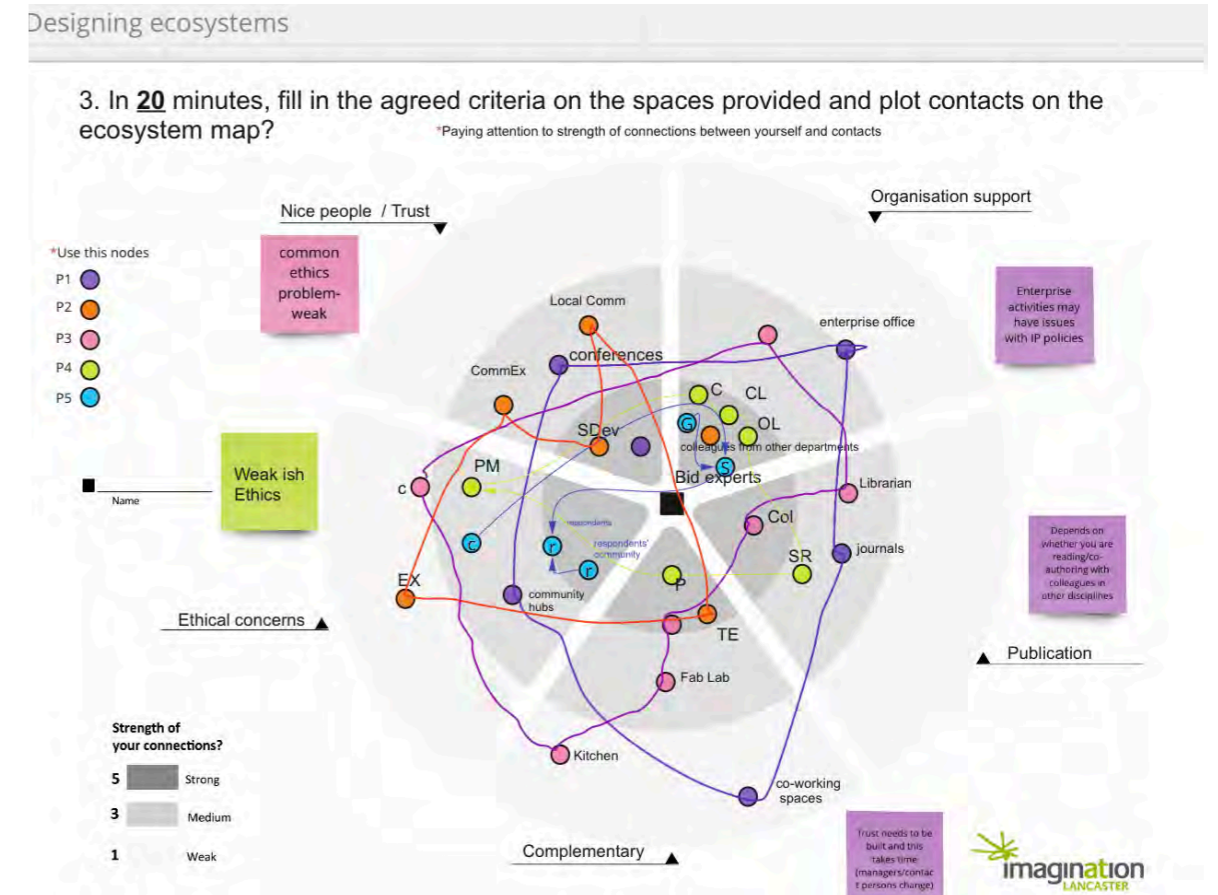


Figure 4. Workshop output

part's actions were to copy their node icons and paste in their preferred boxes to answer the questions.

The 1-hour virtual workshop plan is described as follows.

**Introduction:** a 10-minute pre-recorded video presenting a step by step design framework in MIRO whiteboard (virtual environment) followed by a 2-minute Q&A.

**Icebreaker:** picking up something from the desk and sharing how it relates with previous participant's 'thing'.

**Assign participants to breakout rooms and agree on criteria needed for a research ecosystem:** Listing criteria for ecosystems and choosing five common ones to use in the design process

**Identifying key contacts in your individual ecosystems:** List your contacts necessary for conducting successful research

**Plotting strength of ties between contacts:** Decide on the strength of your ties using the design mapping tool

**Analysing visualisation outputs and discussing how to activate and sustain new ties:** Looking at the combined visualisation of your networks in the tool: (1) identify research network insights and (2) decide on how you will activate and sustain these insights

**Evaluate the tool:** Participants complete an evaluation table by responding to questions on the tool usability

**Presentation and feedback:** Return to the main session and present insights

#### Workshop outcomes

During our virtual expedition, we had a low attendance of participants than expected, this was observed across other conference workshops. One of the reasons why participants who signed up for the workshop did not attend was related to technical issues of finding workshop links and challenges associated with different time zones. The low attendance meant that we had to adjust the plan to one main session, where 4 par-

ticipants were all doing the design together in a single MIRO whiteboard instead of the initially planned three whiteboards. This reduced the complexity of navigating between breakout rooms and whiteboards, thus making the facilitation much easier. Operating in one session enabled us to address all design questions promptly by doing e.g. copying and pasting contacts on the tool. Deciding and mapping criteria, contacts, and the strength of ties were a challenge for some participants, we resolved this by demonstrating the process on the same design space, thus providing design hints to guide participants. They creatively engaged with the mapping tool through MIRO without issues (Figure 4).

Although the virtual workshop was the first of its kind, participants developed mental images to represent how their research ecosystem networks are configured, and these combined networks scaffolded a dialogue on future trends of research ecosystem configurations, to maximise the research output. This contributes to the question of how future ecosystems might be designed, taking an active role to visualise and engage potential collaborators in designing future reconfiguration of ecosystem networks. Finally, participants thought the tool was handy in aiding engagement with new actors, providing them new understandings in designing innovation ecosystems. This project also revealed interesting insights into designing and running online workshops.

#### Conclusion

This research addressed current challenges of co-designing in virtual environments through a set of principles to work collaboratively with participants geographically distributed around the world. The case study presented here demonstrates the application of this set of principles for designing and running online workshops clustered in three co-design layers of practice. We have presented a redesign process of a conference workshop that was delivered in a virtual environment using MIRO

and Microsoft Teams platforms as analogous to the location of the physical workshop.

Based on the outcomes, our redesign approach has shown how conference workshops can be delivered in virtual environments in a timely manner. The introduction of a pre-recorded video seems to be a new requirement in online workshops and conferences. Videos enable facilitators to keep control of the timing and content, and to rehearse many times before sending a good presentation version. Although achieving same outcomes as physical workshops are not feasible, designing short-term activities and resources can reduce the information workload, enabling desired outcomes through interactive mutual learning of those involved in the co-design process. The technical producer, a person who knows how to manage mediating technologies, plays an essential role in designing appropriate interactions, ensuring that everything goes well during online sessions. A more active support during the delivery of the virtual workshop has presented an effective way to make sure participants complete the tasks in the right way. This may require co-facilitators to develop their digital language skills and blend them into their facilitation approach to keep a good flow of online sessions and provide support to small groups of participants.

The proposed set of principles offers an approach to plan, design and deliver distributed co-design sessions to engage with stakeholders and external partners in existing and new projects. The proposal presented here has profound implications for those designing online events as it supports an emerging co-design practice that might remain up to date as part of the 'new normal' in the post-covid-19 world. There are different routes that the knowledge generated in this paper can be expanded, refined and disseminated. As this paper reports a single-case study, further research is needed with other contexts to enhance the transferability of the design principles, such as people with lack of access to high-tech equipment and fast broadband as well as homebound, i.e., those ones who are unable to leave their houses, typically due to chronic illness or old age. Another suggestion involves refining the principles with groups of non-designers to guide them to create their own Dis-Co approaches.

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