

A FRAMEWORK FOR IMPROVING KNOWLEDGE EXCHANGE TOOLS

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This thesis is submitted in partial fulfilment of the
requirement for the award of the degree of
Doctor of Philosophy (PhD)



Lancaster Institute for the Contemporary Arts
September 2019

Declaration

This thesis has not been submitted in support of an application for another degree at this or any other university. It is the result of my own work and includes nothing that is the outcome of work done in collaboration except where specifically indicated. Many of the ideas in this thesis were the product of discussion with my supervisor Professor Leon Cruickshank.

Excerpts of this thesis have been published in the following conference manuscripts and academic publications

Galabo, R. and Cruickshank, L. (2019) 'Co-designing Improvements of Knowledge Exchange Tools', *The Design Journal*. doi: 10.1080/14606925.2019.1595011.

Galabo, R. and Cruickshank, L. (2019) 'Redesigning Tools for Knowledge Exchange. An Improvement Framework', *The Design Journal*. doi: 10.1080/14606925.2019.1594962.

Galabo, R. and Cruickshank, L. (2019) 'Improvement Matrix. Prompting New Ways of Thinking about Knowledge Exchange', *The Design Journal*. doi: 10.1080/14606925.2019.1595029.



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'No one is born fully-formed: it is through self-experience in the world that we become what we are'

'Ninguém nasce feito: É experimentando-nos no mundo que nós nos fazemos'

Paulo Freire (1993)
Brazilian educator and philosopher

Abstract

Knowledge exchange involves sharing ideas, expertise and approaches among individuals, communities or organisations within an open design space, such as workshop-like events. These spaces enable people to engage collaboratively in the design and decision-making of projects, programmes and policies that affect their lives, where tools are often used to support creative engagement activities that aim at achieving a desired outcome. However, many generic tools or prescribed tools do not fit to skills or expectations of those participating in knowledge exchange processes. One approach to design better creative engagement is to improve tools for specific contexts as well as the flexibility in tool use to fit different design practices. Within this scenario, this thesis proposes a framework to improve tools as a response to the research question: How can knowledge exchange tools be improved? The framework called Improvement Matrix was built through a literature review on the knowledge exchange approaches of co-design and participatory design, and tested in practice through a series of workshops as part of an action research. Drawing on the theories and practices of designing tools, the framework was tested through three case studies, where engagement practitioners genuinely interested in improving tools to develop their practice, co-designed improvements of tools using three dimensions within the overlapping practices of planning, facilitating and doing activities, providing evidence to develop a deep understanding of the proposed framework. In conclusion, the review of the case study findings with experts in participatory design approaches and tools, suggested that the developed framework was useful and applicable to a variety of knowledge exchange practices, promoting new ways of thinking about the design of tools and workshops. Further research involves exploring the framework with designers, practitioners or other design research areas to see how it would work in practice, tracking changes in the framework over time.

Acknowledgements

I would like to thank the National Council for Scientific and Technological Development (CNPq /Brazil), which provided me with funding to undertake this PhD research project in one of the most prestigious universities in the UK. Equally, this project could not have been completed without the excellent supervision of Professor Leon Cruickshank, the support of the Leapfrog team: David, Gemma, and Debbie, and the contribution of Leapfrog external partners. I must also acknowledge the award of the grant from Research Travel Conference Fund donated by the Friend's programme, which financially supported me in the final stages of this doctoral thesis.

Thanks are also due to everyone at LICA staff and the PhD community who supported me in my PhD journey, especially to Andy, Hayley, Claire, Roger, and also Nadeem for giving feedback that inspired me to conduct better workshops.

I am grateful to all the people I have met at Lancaster University and the Graduate College, with whom I shared meaningful moments, passions, knowledge, and stories. These experiences are what made me who I am today. The Graduate College has been a wonderful international community in which I 'grew up' and lived for four years during my PhD studies in Lancaster. The personal relationships forged in these years will stay with me forever.

I would also like to thank my Masters supervisor Professor Carlos de Salles, who introduced me to the 'open world' and has continued to support me in my academic career.

Finally, I would like to thank my family for all their unconditional love, and for encouraging me to go to university and for supporting me in all my choices in life. Thank you for the core values, beliefs and culture that also made me who I am today.

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1. Introduction

This PhD project is motivated by my personal interests and came about following years of Undergraduate and Masters studies in design. I have been looking for ways to make things better through design, in the belief that, more or less, everything can be improved.

During my industrial design undergraduate course, I was looking for meaning in the studied subjects for my practice as a future professional designer, so I could understand how to make the most out of each subject and apply the knowledge in the design of products. In my final years, I became interested in usability and sustainable design, looking at how to make better use of resources and useful products. My first contact with sustainability was in a lecture about the process of designing environmental products supported by the book 'Design for Environmental Sustainability' authored by Ezio Manzini and Carlo Vezzoli (2008). Ezio Manzini is known as one of the design thinkers who called for radical changes in design in the late 1980s and early 1990s.

Although the sustainable design field had become one of my interests, I had to leave this interest aside as the market-oriented design perspective is still dominant in Brazil. My interest in making things better has not changed, rather it has become more focused on digital environments. I decided to follow my other interest in the interdisciplinary field called human-computer interaction, where I drew on the influence of early user-centred design approach and cognitive ergonomics (i.e., human-machine systems), and joined an ergonomics research laboratory. My two final-year projects of my third and fourth years were in ergonomics and website usability testing.

During my Masters degree studies, I joined a multimedia research laboratory and became interested in designing authoring tools. These tools enable people to create a final application without knowing programming language. For example, we developed a tool for generating specific apps for interactive digital television, such as a TV news app (Vieira and Galabo et al. 2015) and learning objects for mobiles and websites (Damasceno, Galabo, Soares Neto, 2014). This approach democratises innovation as it provides final-users with a digital tool to develop their own multimedia applications for a particular context, assigning the design and development activities to end-users.

After my Masters graduation, I worked as a research fellow in a private non-profit organisation for a year (2014-2015), where I planned and facilitated a series of five creative workshops as one of the projects I delivered during this period. These workshops for secondary technical school pupils and instructors were focused on designing technologies and solutions to improve accessibility, education or to tackle water issues as part of an education action project. I had to deliver these workshops to over 50 participants together with one or two co-facilitators, as each workshop required a very active facilitation. As part of this experience, I put into practice some of the facilitation techniques and processes described by Marc Tassoul (2009), such as brainstorming and idea presentation. However, some of the participants did not follow my instructions, which led us to change our approach and leave them to be creative with materials we provided in each workshop, such as play-doh (modelling clay), sharpies and A3 sheets.

Reflecting on this experience, I became aware that rigid creative processes were not appropriate to solve complex social issues, such as water issues. Then, I started to think about ways to improve the delivery and facilitation of such creative workshops. This awareness is represented in the design literature as the design shift from an industrial design practice, where a design thinking approach focused on goals, constraints, rules, problem-solving, and engineering methods were focused on the fixed meanings of the 'physical' world, to a more interpretative analysis of problems and creative solutions based on insight. This experience made me pursue a PhD to develop an approach that could put all my interests together: making things better, sustainable practices and tools, in order to learn how to change my own practice for the better. My idea of improving tools reflects on these interests and personal beliefs and is aligned with the context of the landscape of creative practices of designing workshops for knowledge exchange. Therefore, I have undertaken a design PhD to pursue this idea of reflecting upon creative practice in order to make improvements and as a rejection of rational methods in design practice.

In October 2015, I started my PhD and joined a research project aligned with my interests called Leapfrog, a 3-year research project led by ImaginationLancaster at Lancaster University in partnership with the Innovation School at The Glasgow School of Art, funded by the Arts & Humanities Research Council (AHRC). The Leapfrog team worked in collaboration with community and public sector partners to design and evaluate new consultation practices and tools to engage communities in public service decision-making, supporting a more active role in society. Leapfrog tools were co-designed in collaboration with public sector and community partners to support their practices in engaging communities in public service decision-making and creating new applications without using designerly approaches.

As a practice-based research PhD in design, I led a research project seeking to understand how tools could be improved to enable people to design better creative workshops as part of the larger research project. This thesis reports how engagement practitioners collaboratively improved tools, and how they transformed their practices in a Leapfrog short project called 'Improve It'. This project aimed at developing a **framework for improving tools** to make better **knowledge exchange** processes in open design spaces, where people collaborate in the design and decision-making of projects that affect their lives, such as workshop-like events to develop solutions for water issues and challenges. I was interested in developing a framework that helps practitioners to improve tools like proformas, worksheets, or artefacts used for enabling a more appropriate and creative exchange of knowledge between those involved in the process, in order to achieve desired outcomes.

To improve knowledge exchange processes, I needed to propose a change in current practice, and understand both how engagement practitioners understand practice, and the conditions in which they implement the proposed change. This enquiry was carried out through a collaborative approach, where I proposed a theoretical framework that brings together human-centred design, participatory design, and open design concepts (PART A). This framework was tested in practice with engagement practitioners, enabling them to redesign tools to fit and improve their own practices, providing evidence to test the framework (PART B). This thesis is divided into two parts, briefly outlined below.

PART A: Literature review and research methodology

Part A presents three types of narrative reviews that were conducted in this thesis (Paré *et al.*, 2015; Onwuegbuzie and Frels, 2016): a historical review, a theoretical review and a methodological review. The historical review places the current situation of design practices within historical events, in order to highlight key issues, gaps, unexplored areas,

opportunities, controversies, patterns and trends (Paré *et al.*, 2015; Baker, 2016). The theoretical review examines how theories shape and frame the research conducted in this thesis. The methodology outlines the potential research methods used to address a specific research question, describing strengths and weaknesses, and looking at how they have been used in design research studies, providing directions to implement a research plan (Onwuegbuzie and Frels, 2016). These literature reviews served as vehicles for **theory building** (Schryen *et al.*, 2015) and defining the **research design** chosen to conduct this PhD research project. Part A is sub-divided into four chapters.

Chapter 2 - Understanding design and co-design practices

How things work here, and what is the gap?

This chapter defines what design is, describing how design has evolved toward the use and development of tools to support everyday design practices, reviewing the landscape of practices involved in co-design and participatory design. The historical review focuses on the design shift from 'designing for' to 'designing with' people, allowing an understanding of current design practices, excluding engineering and design literature focused on objective language that deals with the 'certainties' of the physical world. The chapter aims at familiarising current design stances and debates, reviewing what is happening in design practice to identify patterns and trends in the literature, and evaluating areas of knowledge in which this thesis can make a contribution. The chapter concludes with a focused research question, and directions for further research.

Chapter 3 - Designing and improving tools for Knowledge Exchange (KE)

What is improvement? What is a tool? How have designers created tools?

This chapter examines how theories of improvement and tools shape and frame the understanding of this thesis. It reviews the concept of improvement, tools and similar terms used within the design context, looking at the shift in the development of improvements and tools from the perspective of scientific work design in the early nineteenth century towards a more democratic perspective that started to emerge in the 1950s. The chapter also explores how tools have been created within different design traditions that emerged from the design shift to identify mechanisms for improving tools. The chapter outlines the design theories that underpin this thesis, providing insights for the development of a theoretical framework that seeks to answer the thesis research question.

Chapter 4 - Building a framework for improving tools for knowledge exchange: Bringing design practice and tool theories together

How can knowledge exchange tools be improved?

This chapter reviews the patterns identified in contemporary design practices in Chapter 2, bringing together the practice of designing participatory design and co-design processes and the theories for designing tools to support these practices explored in Chapter 3. Building on chapters 2 and 3, this chapter concludes with the development of a theoretical framework that orients the investigation of a new tool design practice, which seeks to understand how tools can be improved.

Chapter 5 - Research methodology

What are the methodology, methods, techniques and procedures used in this PhD research project?

This chapter introduces research through the action of design (action research) as the practice-based approach to investigate the practice of co-designing improvements of tools, and presents the research design of this PhD study. It reviews the methods used in design research that are appropriate to respond to the main research question of this PhD, providing a rationale for employing the methodology, methods and techniques that are combined in a systematic manner to contribute to the field of participatory design and co-design.

PART B: Improve It project – pilot and case studies

Part B presents an action research project on improving tools for knowledge exchange called Improve It, a series of workshops delivered to engagement practitioners composed of two pilot studies and three case studies. These workshops took place mostly at ImaginationLancaster at Lancaster University, where practitioners explored and redesigned tools in practice through testing the improvement matrix framework developed in Part A as the design proposition used for answering the research question: **How can tools for knowledge exchange be improved?** Part B is divided into three chapters presented as follows.

Chapter 6 - Pilot studies: Preparing for collecting evidence

What adjustments are necessary to conduct a good case study?

This chapter presents the preparation for conducting the main case studies. It describes the adjustments and protocols needed to conduct good case study research through co-design workshops. This multiple-case pilot study involved two workshops, where the researcher delivered one workshop to a case study team (University academics and researchers) and another one to a group of engagement practitioners from Lancashire County Council. These workshops describe the design and refinement of the case study design, the entry process into the community of practitioners, and how the workshop structures were set up for participation through the action research cycle of planning, acting, observing and reflecting.

Chapter 7 - Case studies: Developing the Improvement Matrix

How do practitioners improve tools using the Improvement matrix framework?

This chapter presents how the researcher conducted and analysed a series of three workshops as part of an action research project called Improve It. Building on the lessons learnt from pilot studies and using a chapter structure based on the action research cycle, these workshops are reported as a multiple-case study, featuring the researcher's planning, acting and reflecting processes of designing workshops for improving tools. Each section describes a workshop, where the researcher tested the Improvement Matrix framework in collaboration with groups of engagement practitioners to understand how they improve tools in practice. The last section presents the cross-case synthesis and the results conducted alongside the reporting and sharing processes in an iterative manner.

Chapter 8 - Sharing Case studies: Reviewing the Improvement Matrix framework

How to go on in practice?

This chapter presents the process of reviewing the draft case study with peers, who are experts in participatory design approaches and tools and interested in this research. It presents the overall Improvement Matrix framework, and the summary of discussions about the framework and its transferability, limitations and suggestions for further applications and development.

Part A - Literature review and methodology

2. Understanding design and co-design

This chapter aims to define design and present how the design practice has developed into a landscape of design traditions that shapes participatory design and co-design. The chapter discusses how designers, non-designers and tools have played a role within the evolution of design practices. This historical literature review begins from the 1960s, when radical changes in design practice started to change the frames of reference for understanding design, known as paradigm shift (Kuhn, 1970). The concept of paradigm shift was initially used in revolutionary processes in science but is now broadly used to describe fundamental changes in the understanding of any domain, discipline or field. Such shifts define new directions for research, demanding an understanding of what is already known in order to produce new knowledge that informs the next paradigm. In design, the paradigm shift occurred when people started to be included in design and decision-making processes, leading to the emergence of different design traditions. This chapter explores these traditions from the lens of understanding the landscape of practices that underpins co-design and participatory design. The purpose of this chapter is to place this study in a historical context, to show familiarity with state-of-the-art developments and to identify the likely directions for future research in the design field.

2.1 What is design?

The shorter Oxford English Dictionary (2010) defines design as a verb and as a noun:

Design, verb

verb trans. Plan and execute (a structure, work of art, etc.); fashion, shape; make a preliminary sketch for (a work of art etc.); make drawings and plans for the construction or production of (a building, machine, garment, etc.).

verb intrans. Be a designer of works of art, buildings, machines, garments, etc.

verb trans. Form a plan or scheme of; contrive.

verb trans. Intend, purpose, (something, as, to be, to do, doing, that); create or intend for a specific purpose.

Design, noun

A plan or scheme conceived in the mind; a project.

A purpose, an intention, an aim

A preliminary sketch; a plan or pattern from which a picture, building, machine, etc., may be made.

An idea as executed, the combination of elements in the finished work; an artistic device, a pattern.

The action or art of planning and creating in accordance with appropriate functional or aesthetic criteria; the selection and arrangement of artistic or functional elements making up a work of art, machine, or other object.

In addition to these definitions, design is not only used as a verb and noun, but also popularly as an adjective, with reference to fashion products with a high-value design or created by famous designers (e.g.: designer clothes). Design as a verb refers to the planning, execution, and creation of something for a specific purpose, which is referred to here as

design processes. As a noun, design is referred to as an “idea as executed”, such as the outcomes of a design activity like products, services, experiences or policy. Ken Friedman (2003) points out that most of the design definitions share common characteristics. He argues that design is defined as a process rather than an outcome, in which design processes aim to solve problems, meet needs, improvise situations and create something new or useful.

Design processes can be described in many different ways. Hugh Dubberly (2005) has compiled over one-hundred descriptions of design and development processes in his incomplete book ‘How do you design’¹ available for download. Lawson and Dorst (2009) describe the design process as a combination of two modes of thinking: the convergent and divergent stages. Convergent thinking is a rational and logical process that requires deductive skill to find the right answer to a question. This problem-solving process is represented by the model of posing a problem, and generating, evaluating and choosing a solution. On the other hand, divergent thinking is an imaginative process that requires skill to generate ideas, where there is no clearly correct answer. That is, a creative process often characterised by sudden insight, the so-called creative leap or a ‘Eureka’ moment.

The Design Council (2007) developed a design process model that maps the divergent and convergent stages based on research with eleven different global design companies with a reputation for successfully applying design, and the creative problem-solving (CPS) model developed by Alex Osborn (1953). The model originally consisted of two diamonds and was later revisited and illustrated with three diamonds (Tassoul and Buijs, 2007). The Design Council model is a simplified version of the CPS model and illustrated by a double diamond divided into four distinct phases: Discover, Define, Develop and Deliver. Each phase represents a quarter part of the diamond, and also, the convergent and divergent stages as illustrated below.

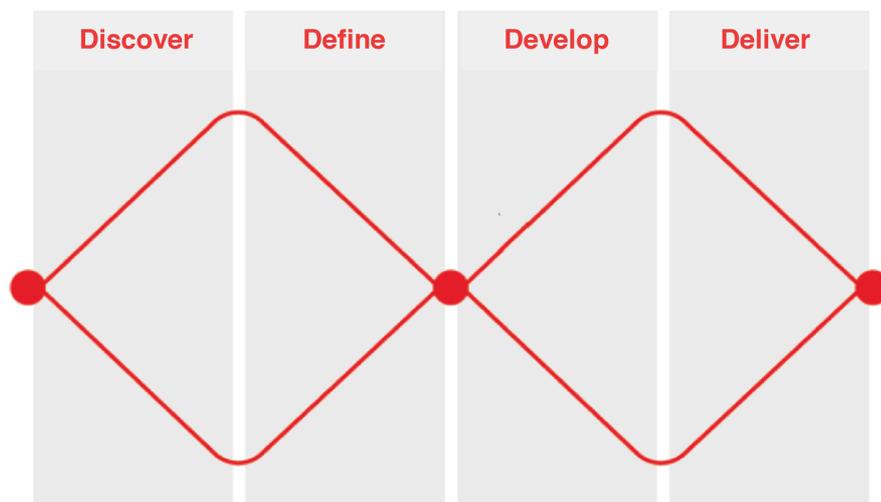


Figure 1. Double diamond design process model (Design Council, 2007)

The Discover phase covers the start of a project, when designers seek inspiration, keeping their minds open to insights and influences. This phase helps to identify opportunities, problems or user needs, and introduces the context in which design can provide a solution. In the Define phase, designers do the synthesis of the discovery phase, which is when the data analysis and the briefing definition, with opportunities for designing a product or

¹ [Beta] How do you design? (2005) <http://www.dubberly.com/articles/how-do-you-design.html>

service, will occur. In the Develop phase, designers improve ideas, prototype solutions, and test concepts in an iterative process. At the end of this stage, the product or service is ready for delivery to manufacture. In the Deliver phase, designers perform final tests, evaluations and collect feedback. Although the double diamond model was developed in a professional setting, it can be used to describe any kind of design practice.

Design as practice goes beyond design processes and dictionary definitions. *'Design is defined differently in different countries with our understanding of it changing over time'* (Cooper and Press, 1995, p.7). For example, there were a series of attempts to translate the word 'design' in Brazilian Portuguese to describe the practice of design. The word design was initially limited to drawing, where the design professional was referred as Industrial Drawer, and then translated to *'projética'*, before finally being used in the same way as in English, as 'design', to refer to the practice and outcome of the process.

Defining design practice is a complex task due not only to different countries, but all the other cultures that design is a part of. Friedman (2000) argues that the nature of design is integral to many disciplines, such as natural sciences, humanities and the liberal arts, behavioural sciences, human professions and services, creative and applied arts, technology, and engineering. Nigel Cross (1999; 2001) proposes the study of design practice as a discipline distinct from science and humanities and independent of professional design practices. In contrast to the study of these practices, a strand in design research not well understood or little represented and separated from the conventional design economy started to emerge (Cruickshank, 2014), where amateurs, craftsmen, experts by experience who do vernacular designs in a traditional mode (Manzini, 2015). Design as part of any professional practice and design as everyday practice are discussed below.

Design as a distinct discipline is understood as design studied within its own culture, body of methods and processes, composed of a community of individuals motivated to understand principles that shape the discipline (Archer, 1995; Cross, 2001; Julier, 2014). In this respect, design researchers such as Nigel Cross, Bryan Lawson and Kees Dorst have focused on doing research on professional designer processes referred to as 'designerly' processes. In this context, design as a discipline seeks to develop approaches to theory and research in design, generating knowledge of and about the artificial world and how to contribute to the creation and maintenance of this domain of practice (Cross, 2001).

As an activity that professional designers do, design requires the use of special skills acquired through education and training on a specific design field, such as products, services and systems. These acquired skills, which involve creative problem-solving, idea visualisation, evaluation and management, can then gradually evolve through years of practice in a specific design field, achieving a high level of expertise in a designerly way of thinking. Lawson and Dorst (2009) synthesise this designerly thinking in five core design activities and skills required for successful design: Formulating, Representing, Moving, Evaluating, Managing. This description of design thinking as a learning process was built on Donald Schon's idea of reflective practice (1983), where any design professional frames a problem, performs moves towards a solution, and evaluates these moves, which might lead to new moves or the seeking of a new frame in a learning cycle process towards a design solution in a specific domain.

Considering that everyone conducts similar design activities to change current situations in everyday practices, such as deciding the style of communication to engage with an audience, deciding an outfit or cooking a meal, then everyone can be considered as a designer. What

differentiates the practices of design professionals and non-designers is that they have traditions of practice, processes, and working styles which are characterised by established ways of doing, speaking and the relationships with people and objects of their practice (Kemmis *et al.*, 2014; Manzini, 2015). It is in this particular context, where anyone can be a designer within their own culture of practice, that this thesis considers design.

Victor Papanek's definition of design as a fundamental human activity inspired the discussion on a more open design practice (Cruikshank, 2014; Manzini, 2015). Papanek (1971, p.3) states "*All men are designers. All that we do, almost all the time, is design, for design is basic to all human activity. The planning and patterning of any act towards a desired foreseeable end constitutes the design process*". This statement does not sound politically correct in contemporary society; better to say that all people are designers, not just men. Nevertheless, design as an ability or skill developed in any practice broadens the meaning of design, bringing up the discussion about who is a designer nowadays.

Design and architecture theories have traditionally been concerned with the study of objects and monuments designed by professionals (Rapoport, 1969; Lawson, 2005; Cruikshank, 2014). However, vernacular design has its own established way of doing things as a result of folk or popular traditions, such as igloos and cartwheels exemplified by Lawson (2005), which is not controlled by professional designers. This scenario has started to change in design practice, when designers and non-designers started to work together to develop better outcomes from the 60s onwards. This shift from designing things for people to designing things with people is presented in the following section.

Understanding design practice from professional and 'amateur' perspectives is an essential component in understanding the kind of tools this research is looking at, and the role tools play in developing this collaboration in the design process. As this thesis focuses on the improvement of tools to develop design practices which do not necessarily involve professional designers in the process, the definition of design as **the process in which people devise courses of action aimed at changing existing situations into preferred ones** (Simon, 1996, p.111) is used to refer to any form of design activity. The following section will look at the shift in design practice, where the distinctions between designers and 'non-designers' started to blur when it came to the design of desired outcomes in an existing situation.

2.2 Design practice: the shift from 'designing for' to 'designing with' people

Many authors have approached the design shift from different perspectives to understand participatory design and co-design practices. A literature review on the design shift provides understanding of what is currently known about design practices, identifying areas of knowledge in which this thesis can make a contribution. This section will focus on reviewing the literature that looks at the involvement of designers and non-designers in design processes.

Sanna Martilla and Andrea Botero (2013) look at the design shift from technological possibilities for collaboration in HCI and interaction design, tracing the design 'turns' from a historical view enabled by technology rather than any deterministic design paradigm shifts, where turns can be understood as transitions from a current design concern towards a new one. They present the evolution of design practice in four turns: Usability, Sociability, Designability, Openness. The key concept here is that they propose the openness turn in design that can be developed from previous turns, where other forms of design should be taken into consideration. The concept of turns is different from paradigm shifts because the

former is a development from previous ideas while the latter is a radical change in the understanding of any domain.

Elizabeth Sanders and Pierre Stappers (2008) discuss the shift in design practice and research from user-centred design and participatory perspectives, looking at the shift from the perspective of design disciplines and the roles of design researcher, professional and user in the design process. They look at the shift from a point of view of the design actor, where co-design requires the presence of designers due to their 'highly developed skills that are relevant at larger levels of scope and complexity'.

Saad-Sulonen (2014) looks at conceptual and theoretical perspectives of participation in HCI and urban planning, briefly reviewing traditional approaches from consultation to participation, extending these to the emerging self-organisation concept, where participation is initiated by citizens instead of government. Then, she provides an analytical tool that summarises the main types of participation in the design of digital technology and urban planning that look at the form of participation, roles, and theoretical/practical reference. Similarly, Yanki Lee (2006) proposes an analytical tool to understand participation and the designer–user relationship, describing the operating space, initiators, type of outcomes, approach and roles of users and designers.

Zamenopoulos and Alexiou (2018) trace co-design roots from community design, socio-technical design, co-creative design, and social design traditions, looking at key concepts, interest and motivations that shape the landscape of co-design to understand their relations to research, such as the practices, politics and epistemology of co-design. The authors highlight that one of the key areas needing attention during the development of any co-design activity or project involves the practices of co-design. These practices are related to the approaches, methods and mechanisms that are used during the co-design that this thesis focuses on.

Applying these frameworks to understand participatory and co-design practices, this thesis looks at the design shift in a similar way to previous frameworks, focusing on the core of such practices (community design, Scandinavian participatory design, human-centred design, and open design) from historical and practical perspectives. It looks at specific historical key concepts, such as technological and political aspects, relationships between designers and non-designers, and engagement mechanisms that underpin these practices of designing with people in order to build an understanding of what this thesis calls participatory design (PD) and co-design practices, two different domains in which this research seeks to contribute to the body of knowledge.

2.2.1 Design shift: the need for reconceptualising traditional design practice and professionals

This section will briefly look at the historical shift from the birth of the designer in the industrial period in the mid-19th century to the aftermath of the Second World War in the mid-20th century, when the starting points for the shift in design practice took place, setting the scene for emerging practices from the 1960s onwards.

In a historical sense, considering design as a practice of planning and making things, there have always been people doing design at a certain level, such as artisans, entrepreneurs and craftsmen and women occupied in small-scale production of goods, or their maintenance. However, the advent of the Industrial Revolution took design practice to another level. In

1830, industries required people who could create goods and control the means of production. In contrast, there was a shortage of workers qualified in art manufacture (Doordan, 1995). This deficiency resulted in the establishment of government schools of design in the 1850s, in which over fifteen thousand people attended visual innovation and manufacturing courses (Cruickshank, 2014). These schools were focused on the production techniques available for such as textiles, furniture and ceramic (Sparke, 2013; Cruickshank, 2014). That is, they were training people to acquire technical skills, focusing on designing for manufacturing. In this period, the design practice was closely linked to mass production practices, including mass communication, enabled through industrialisation (Buchanan, 1998; Swann, 2002).

In the early twentieth century, designers emerged as an independent profession. These professionals were established around a special skill, traditions of practice, associations, and distinct types of working with specialised knowledge, and were looking to elevate their social status (Swann, 2002; Michlewski, 2015). This desire for professional recognition resulted in an attempt to standardise the design processes, leading to the adoption of scientific methods in the 1950s, 1960s and 1970s (Cross, 2001; Michlewski, 2015). In this period, design started to be recognised as an intermediary position between production, market demand, and business issues, with *“its ability to relate both to the irrational behaviour of consumers and the increasingly rational process of mass manufacturing”* (Sparke, 2013, p.21). This hierarchical move put the design professional as the person who knew best how people should live, determining what was considered ‘rational’ behaviour in society.

However, these rational methods and hierarchical positioning were not appropriate for addressing complex societal problems that increased in the aftermath of the Second World War, where solutions exceeded the capacity of the existing professional expertise and division of labour (Rittel and Webber, 1973; Votolato, 1998; Cross, 2001). This class of complex ‘wicked’ problems (see below), such as poverty or environmental pollution, do not have a single answer and are not objectively and clearly defined as are tamed problems, such as puzzle solving, mathematical or chess problems, well-defined problems with a clear solution and an ending point. The systemic view, focused on goals, constraints, and rules, is unsuited to solving wicked problems, since they are unique and cannot be defined, goals cannot be reached, and rules change according to the context (Rittel and Webber, 1973; Coyne, 2005).

Richard Coyne argues almost all problems are wicked. These problems are ‘comprised of diverse constituencies and stakeholders with conflicting agendas and concerns and exist at multiple levels of spacious-temporal scale’, such as strategic planning, transportation, healthcare, and policy design (Irwin *et al.*, 2015, p.16). For instance, when design and planning practitioners are devising a solution for ending domestic violence, they deal with a situation where culture, legislation, social views and mental health problems are all intertwined. Once they devise a solution for one issue, another unexpected situation may emerge, putting themselves in a situation of uncertainty.

The professional’s job as an expert who can solve problems that appeared definable, understandable and consensual has become an issue of concern for society. Professionals have started to lose confidence in dealing with such ‘wicked’ problems and are criticised through an anti-professional movement and the rejection of conservative values, which has required the reconceptualisation of the professionals’ task (Rittel and Webber, 1973; Schön, 1983). Since then, contemporary practitioners, researchers and theorists have worked to develop more appropriate tools and approaches to deal with ‘wicked’ problems, to include

non-designers in the design, planning and decision-making processes as a rejection of traditional design practices. This has led to the emergence of new ways of designing with people, private and public sector in different contexts, such as community design, Scandinavian participatory design, user-centred design and open design approaches.

Open design approaches have roots in radical design movements, the growth of the DIY (Do-It-Yourself) industry and consumption, and the democratisation of production and communication technologies and tools from the 50s onwards. Citizen participation in urban planning can be traced back to the early 1960s as part of the human and social rights movement, where many design and planning professionals advocated for the right of poor citizens, developing methods of citizen participation in financing and planning decision-making in community improvement programs (Sanoff, 2008). Participatory design practices have their roots in the seminal 'Design Participation' conference held by the Design Research Society in the UK in 1971 and in the seminal 'Utopia' project in Scandinavia, where users became involved in the design process in the introduction of computer-based systems in the workplace (E. Sanders and P. Stappers, 2008). In the meantime, the participatory movement was extended and 'translated' into the user-centred design approach (UCD) in the United States (Schuler and Namioka, 1993; Kraft and Bansler, 1994; Spinuzzi, 2002; E. Sanders and P. Stappers, 2008). Early UCD approach has its roots in several fields in the World War II period, such as scientific management, human factors, engineering, anthropology and sociology.

Each of these approaches is discussed more in depth in the following section, looking at historical context, objectives, spaces, tools, and mechanisms involved in the culture of practices that enabled non-designers to participate in the design and decision-making processes. The section then concludes with a summary of these practices and discusses current approaches to participatory and co-design practices.

2.2.2 Open Design (OD)

In this thesis, OD applies a broader understanding of design in which professional designers are not part of the process, such as vernacular design, DIY and user-led design practices, where people as creative and active agents change their realities into preferred ones. As previously mentioned, the increasing democratisation of technology in the 1950s and the radical design movements of the 1960s challenged traditional design practice and mass production, supporting the development of OD practices as a critique to industrial and professional design equivalents.

From the 1950s onwards, there has been an increasing growth in the DIY industry and a rise in the consumption of books and materials to support creative activities (Atkinson, 2006; Sparke, 2013). The increasing democratisation of technology and tools in the 1960s, 1970s and 1980s enabled anyone to do home improvements and achieve desirable results in interior design and decoration, which threatened the position of professional tradesmen. Further developments in technology, such as more accessible printing machines, enabled non-designers to manufacture low-cost productions in communication, such as zines, pamphlets and other graphic materials (Cruickshank, 2014). These DIY and vernacular designs enabled by accessibility of tools and means of production, whether for personal pleasure or financial gain, emerged as important practices that changed the notion of people from passive consumers to more active agents of design, as well as producing a source of inspiration for radical design groups that emerged in the same period.

From the 1960s, groups of designers and radical movements against rational design practice challenged the mass production and machine aesthetic designs inspired by transitory artistic movements and pop culture, such as pop art, art deco, and Indian mystical culture (Borja de Mozota, 2003; Cruickshank, 2014; Michlewski, 2015). In this period, there were designers employing techniques that challenged the industrial process and aesthetic, such as a surreal playing with scale (e.g. big baseball context to form a chair), and the revival of 'crafts' in London with the Biba store (Borja de Mozota, 2003), dominated as it was with Art Deco, Art Nouveau and Middle Eastern Kasbah aesthetic designs. These movements represented the shift in taste, asserting that there was no belief in 'correct', 'true', and 'suitable' styles (Guffey, 2006).

It was against a one-way-of-living, thinking, doing and the uniform content led by technology that a radical design group or counter-school, namely Global Tools and Associates (1973-1975), was born (Branzi, 1984). The group developed teaching programmes, workshops and tools for people to design their own objects that required cheap and portable materials and 'poor' technique, enabling people to collectively and creatively modify and control their environment (Catenacci and Galimberti, 2017). These approaches to vernacular design based on low culture, cheap material, local traditions and creativity of masses were welcomed and valued and were later developed in a commercial context in the 1980s with the radical design group Memphis. Their hybrid industrial/craft approach became a reference in design practice and education, where designers were free to appropriate low culture and vernacular designs, undermining hierarchies in the creative industries (Cruickshank, 2014). Appropriating low culture and promoting social engagement by providing tools and alternative education to people were interventions that challenged traditional design practices known as anti-design practices.

Anti-design practices, DIY, democratisation of means of production, processes, components, and materials in vernacular design provided different types of infrastructures that enable non-designers to actively improve their current situations, changing the designer-user relationship. These infrastructures and relationships were further developed with the increasing democratisation of tools, digital production and virtual communities. Researchers and practitioners from different areas started to explore the creativity of active groups of people and their expertise in various domains or areas to innovate from the 1990s onwards.

In the 1990s, there were a few design responses that opened up the creative process to non-designers, enabling them to adapt and change to meet their own needs and tastes, such as Ron Arad's bean-bag chair that could be bought in different sizes and colours and moulded according to the customer's taste, and Ettore Sottsass' modular house (Cruickshank, 2014). In the same period, user-led practices that enabled people to engage in design and development started to be explored under the research topic End-user development (EUD) (Procter *et al.*, 1999; Lieberman *et al.*, 2006; Paternò, 2013). As examples of uses of modular approaches in digital environments, there is a template-based platform to generate multimedia TV newscast applications (Vieira *et al.*, 2015) and design patterns for TV commerce applications (Galabo and Soares Neto, 2015). With these examples of modular systems, end-users can still create something different, but these possibilities are restricted to aesthetic choices.

A more open example focused on digital tools that allow users to create, modify and extend them to meet their own requirements is a freely downloadable multimedia authoring tool

created by a group of researchers in Brazil called Cacuriá². The tool enables users to collaboratively design, store, and distribute multimedia learning objects without knowing a programming language, requiring similar skills used for the design of presentation slides (Damasceno *et al.*, 2014). Transferring the design of learning objects to teachers and instructors helps reduce the time and cost for developing new learning objects, expanding the possibilities of sharing knowledge and best practice in virtual communities.

Similarly, von Hippel (2001) explored the use of toolkits for innovation to transfer the capability of designing improvements in products and services to lead-users, i.e., people who feel a common need in a specific area and are led to improve their situation. Toolkits enable people to test practical propositions in terms of the function that they want a product or service to perform, using a rich kind of tacit knowledge known as ‘sticky’ information, which is not easy for designers to have access to (von Hippel, 2005). The difficult and costly access to the ‘sticky’ information is von Hippel’s main argument for distributing innovation activities to users. Instead of gathering information from users to understand their needs and the context of use to produce a generic solution that tends to be improvements of existing designs and parts, people with a more precise understanding of their own needs design specialised solutions, which is likely to be innovative (von Hippel, 2005). The difference between innovation and improvement is further discussed in the following chapter. As an example of lead users who designed an innovative product, there is a group of enthusiast mountain bike cyclists in California in the 80s, who experienced problems in challenging off-roads tracks, and developed more advanced and effective ‘clunkers’ to improve their practice (Cruickshank, 2014).

The emergence of virtual communities and the democratisation of tools allowed non-designers to openly share creative solutions, ideas, experiences, and information to a group of people interested in exchanging knowledge acquired from design, development, and testing practical propositions (Procter *et al.*, 1999; Atkinson, 2006). Digital environments, tools, toolkits and materials are the key to enable design activities and collaboration led by non-designers to engage in a particular area of interest to improve their own situations and develop innovative solutions. These tools should be appropriate for specific contexts and fit the skills and needs of a group of people to enable them to create more effective designs and desired outcomes.

In summary, the OD is an approach, which anyone – with a particular expertise and interested in changing their current situation – design, develop and test practical propositions through the use of digital or physical tools and materials that enable them to innovate and improve products, services and systems to develop their own situation. The knowledge acquired in this practice can be openly shared between individuals and small groups interested through complex networks enabled by the growth in digital production, distribution, and collaborative systems.

2.2.3 Community design (CD) in architecture and urban planning

Design practice involving citizen participation in community decision-making has been discussed since the 60s and early 70s, when CD centres were established in the UK and US as part of community action, human and social rights movements (Davidoff, 1965; Arnstein, 1969; Forester, 1989; Sanoff, 2008). In the UK, the need for public consultation in planning was formally enshrined in the 1968 Town and Country Planning Act. However, community

² Cacuriá: <http://www.telemidia.puc-rio.br/tools/cacuria.html>

engagement only became embedded in government planning policy in 2005, expressed as a key principle in Planning Policy Statement 1(2005): 'community involvement is an essential element in delivering sustainable development and creating sustainable and safe communities. It is important to mention that the idea of 'wicked' problems came from planning and was later proposed in the design field by Richard Buchanan (1992)

Practically speaking, public participation involves designers/planners trying to get active citizens to take part in decision-making through facilitation approaches, whereas, community participation usually involves social workers, engagement practitioners trying to influence policy through creative engagement activities (Lee, 2006). These activities are now emerging as two distinct creative approaches, where practitioners either use creative acts such as film, photography and storytelling, or use co-design as a KE process framework for the engagement of stakeholders in public decision-making (Cruickshank *et al.*, 2017).

One much-cited concept used to understand citizen participation is described by Arnstein's (1969) ladder of citizen participation, where eight rungs of the ladder, rising from nonparticipation to citizen control, are represented by two levels of nonparticipation (manipulation, therapy) at the bottom, three levels of 'tokenism' that allow citizens to hear and have a voice (informing, consultation, placation) in the middle, and three levels of citizen empowerment at the top that allow citizens to negotiate, engage, and take decisions (partnership, delegated power, and citizen control). Although the terminology reflects the socio-political situation in the 1960s, where community consciousness and a sense of social responsibility started to increase (Sanoff, 2008), it has been ubiquitously appropriated in design discourses (e.g. Lee, 2006; Saad-Sulonen, 2014). Participation in the following decades can be seen as moving further up the rungs of the ladder from tokenism to citizen empowerment.

As a rejection of traditional practices, i.e., a synoptic model of planning based on constraints, and rules, different approaches to citizen participation in decision-making started to emerge (Lane, 2005; Falco, 2016). This section briefly discusses two approaches to citizen participation that emerged in this period, providing theoretical background to understand current practices in community design and planning.

One of the major approaches to citizen participation is the community and plural planning called advocacy planning, originally stated by Paul Davidoff (1965). He argued that the planner should work as an advocate to support special communities' views through the development of methods and structures to enable active citizen participation in public sector decision-making. Advocacy planning represented an important break from tradition, making public participation an objective rather than a technique (Lane, 2005). In the 1960s, advocacy planning was already taking place, led by trained community organizers and groups of students, with little done by professional planners. In either case, Paul Davidoff advocated that a planner's profession should support the development of alternative renewal approaches that could advocate for the low-income communities to include their voices, inspiring many design and planning to reject traditional practice (Sanoff, 2008).

Another major approach to citizen participation was developed around communicative planning theory, also known as interpretative or collaborative planning. In this approach, building consensus should be reached through mutual understanding about concerns, ideas and values of all participants involved in a communicative space that is enabled by a facilitator, who makes sure that everyone's voice is considered in a decision-making process. In communicative planning, participation and engagement of stakeholders should happen

through a collaborative approach and on the social construction of knowledge for the purpose of developing the possibility of action in public spaces (Lane, 2005; Falco, 2016).

Since the publication of the first Planning Act and social and human rights movements, a number of methods were developed to support community-led and communicative planning approaches to enhance citizen participation. These methods, developed over years of experience in engaging with communities, are summarised in handbooks, such as 'Community planning handbook' (Wates, 2000), *Dialogue by Design: A Handbook of Public & Stakeholder Engagement* (Dialogue by Design, 2010). Such handbooks also provide general principles to practitioners who are interested in engaging with their own communities.

An interesting method in the context of this research was developed by Stanley King in the 1970s. He published a book 'co-design: a process of design participation' (1989) referring to co-design as a combination of community, cooperative and collaborative design. In his book, he illustrates a guide to conduct design workshops for public participation, in which he developed the practice based on 190 case studies. Although he refers a co-design artist as 'a person with advanced skills in drawing people and scenes', he addresses the book to five types of audiences: designer professionals, students, policymakers, managers and educators, leaving the practice partly opened to anyone. In this thesis, a partly opened approach is considered as a participatory design instead of co-design. This difference is further discussed in Section 2.2.7.

Joanne Tippett developed a more straightforward toolkit for creative engagement called *Ketso* (Tippett *et al.*, 2011). This toolkit presents a structured workshop method with tools to engage, learn and develop creative solutions with communities, initially used to engage rural communities in planning improvement for their villages. Although the tool with a shape of leaves seems appropriate to the original context, it does not seem to fit well in other contexts. Furthermore, the structure of the workshop leaves little space for people to develop their own facilitation practice. This tool reflects on the researcher's previous experience, where it was noticed that rigid creative processes were not appropriate to deal with complex problems.

Facilitators are the key to make CD work more effective, using a range of approaches to enable creative collaboration between citizens and professionals in order to build consensus and increase participation in public decision-making (Sanoff, 2008). Increasing citizen participation is linked to building a strong sense of community, which has led the willingness of communities to contribute with time, resources, positive efforts to solve community problems and needs, improving their places and current situations (Sanoff, 2008). Facilitation approaches in planning have been appropriated and developed in the Scandinavian participatory design, such as the facilitation of future workshops, in order to develop computer systems that match with skills of industrial workers (Kensing and Madsen, 1992). The facilitation practice is further discussed in Section 4.1.2.

The emergence of virtual communities allowed citizens to organise themselves around public issues of interest, increasing community participation in public decision-making. The concept of self-organisation has recently been introduced into urban planning discourse, which means that citizens initiate community engagement processes to influence public policies instead of governmental organisations (Saad-Sulonen, 2014). In the UK, this form of

participation has been reinforced through Acts, such as the Localism Act of 2011³, the Community Empowerment (Scotland) Act of 2015⁴, and participation weeks⁵ run by the Scottish government every year since 2015, taking engagement to the next level. The localism and community engagement acts in the UK have further changed citizen participation, empowering more citizens in public-decision making, 'shifting the power from government and putting into local people, those who know more about their community (Department for Communities and Local Government, 2011). This new shift and the collaboration with communities require new research, approaches and tools for understanding and supporting best practice (Alexiou *et al.*, 2013).

In summary, the CD is an approach, where anyone interested in public issues can engage with citizens through the use of creative acts, methods and facilitation approaches, enabling citizens in the design and decision-making of programmes or policies that affect their lives. In the context of self-organisation and the increasing empowerment of communities supported by acts, there is a need for more appropriate tools and approaches to enable better community engagement.

2.2.4 Scandinavian participatory design

This section will use the terms Scandinavian design or cooperative design to distinguish from the practices applied outside of the context of industrial workplaces rooted in computer systems. The Scandinavian participatory design began in the mid-1970s from a research project sponsored by the Norwegian Iron and Metal Workers' Union; many projects were developed and carried out in collaboration with trade unions around this period. This was a response to the introduction of computer-based systems in the workplace, as an effort to enable workers to have more influence on these systems (Kraft and Bansler, 1994; Bodker, 1996; Spinuzzi, 2002). Early projects were unsuccessful, producing little changes in the rationalistic approach and the managerial position, which restricted the involvement of unions in the workplace. However, changes in approach in the early 1980s enabled the development of PD, where instead of unions supporting researchers, researchers would support unions (Schuler and Namioka, 1993).

One of the 1980's projects that have contributed to the development of participatory design (PD) practices was a collaboration between academics and a typesetters' union, called the UTOPIA project (1981-1985). This project – arranged by the Nordic Graphic Workers' Union and initiated by Pelle Ehn and collaborators at the Royal Institute of Technology in Stockholm and University of Aarhus in Denmark – intended to give typesetters a voice in how computer-based systems would be implemented at a newspaper (Kraft and Bansler, 1994; Spinuzzi, 2002). The main concept of this PD methodology was the worker participation in early stages of design and implementation of new technologies in their workplace.

The Scandinavian participatory design approach was developed to support the implementation of computer systems with the presence of workers and their skills and tacit knowledge to ensure a better adaptation between technology and how workers perform their work (Kraft and Bansler, 1994; Bodker, 1996; Spinuzzi, 2002). This approach considered

³ A plain English guide to the Localism Act:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/5959/1896534.pdf

⁴ Community Empowerment (Scotland) Act 2015

<http://www.legislation.gov.uk/asp/2015/6/contents/enacted>

⁵ Participation week <https://workforcotland.com/2015/05/12/spotlight-on-participation-week/>

the work process as its origin, where the improvement of working processes occurred through the specification of computer systems based on the workers' skills, instead of data or information flow, like traditional approaches (Bødker *et al.*, 1987; Greenbaum and Kyng, 1991). This contextual enquiry involved the tacit knowledge that workers had acquired over the years, so a computer system would fit into workers' knowledge. This concept was implemented through design-by-doing methods, such as the idea of designing tools and environments to support democratisation of the design process (Kensing and Blomberg, 1998) and future workshops to creatively develop visions of the future use of computers in organisations (Kensing and Madsen, 1992). These two approaches are briefly discussed in the following paragraphs.

To implement industrial democracy between researchers and workers, tools for prototyping were explored in the UTOPIA project, providing a common language to develop a consensus on what workers wanted from computer-based systems. In this approach, researchers developed a series of tools to simulate working processes as way to try out solutions and facilitate the workers-designers process such as (Bødker *et al.*, 2000, p.2),:

- Colour slide mock-ups with picture sequences.
- Low tech mock-ups of equipment (wooden mouse, cardboard laser writer...).
- A graphic workstation for illustrating prototypes of computer-based tools.
- A tool kit (box with waxed cards) for modelling and experimenting with work organisation'.

The future workshop technique, originally used in public planning, was proposed in a system development in cooperative design by Kensing and Madsen (1992). Future workshop was introduced by Robert Jungk and Norbert Müllert (1987) in the 1970s as a technique for engaging citizens in decision-making processes in CD. In PD, the technique has been used for structuring KE processes and shedding light on a shared concern in order to generate alternative visions about the future and technology. In these workshops, participants critique, imagine and propose ideas to introduce new technologies in workplaces, discussing how these ideas can be implemented. This technique is further discussed in Section 5.3.5.

The Scandinavian participatory design was initially an approach aimed at including workers in the early system design process, where workers learnt alongside IT professionals and researchers what could be done to improve their practices in the workplace, assisting designers with ideas to build systems to improve workers' skills. Since the 1990s, PD researchers have been developing methods and tools to involve users to participate throughout the entire design process. These approaches could be limited from users providing skills and experiences without knowing the design outcome or giving information and negotiating the outcome, to a more active participation, where users analyse needs and possibilities, evaluate and select technology, prototype solutions and organise implementation (Kensing and Blomberg, 1998).

From the 1990s onwards, PD started to consolidate and become a mature area of research and practice among design professionals. The first PDC proceedings introduction note presents fundamental ways that PD differs from traditional design (Schuler and Namioka, 1993, p.XI)

- PD rejects the assumption that the goal of computerization is to automate the skills of human workers, instead seeing it as an attempt to give workers better tools for doing their jobs.
- PD assumes that the workers themselves are in the best position to determine how to improve their work and their work life. They are the ones with knowledge about

what they do and what they need. Users are the experts, and designers are consultants

- PD views the users' perceptions of technology as being at least as important to success as fact, and their feelings about technology as at least as important as what they can do with it.
- PD views computers and computer-based applications not in isolation, but rather in the context of a workplace; as processes rather than as products.

The PDC represents the consolidation of what Kuhn calls the 'disciplinary matrix' (1970), where a community of researchers that share common values and understandings are engaged in solving the questions that emerge within a paradigm shift. In summary, this paradigm shift is represented by the changes in the design of tools instead of machines, the expertise of the design process passing from designers to users, the criteria for success moving from technology-centred design to user-centred design, and the approaches going from a design focused on the product to a design more focused on the process (see 2.1). These concepts are further discussed in the following chapter.

In 1998, the same team involved in Utopia developed computer tools for collaboration in an elementary school setting in England and Sweden, where they found that they were seeing participants less as users and more as partners and inventors (Bødker *et al.*, 2000). The expansion of the PD practice in new domains and countries is evidenced on a review of PDC proceedings from 2002 and 2012 (Halskov and Hansen, 2015), which presents participatory approaches adopted in healthcare, civic engagement, telecommunication technologies with a different approach outside of the industrial democracy.

In current design discourse, PD is consolidated as a practice and research that embraces a collection of principles, practices, methods and tools developed over the past five decades. There is a significant development on PD approaches disseminated through conferences and journals (e.g. the biennial PDC and the Computer Supported Cooperative Work journal as well as popular handbooks, such as 'Design at Work: Cooperative Design of Computer Systems' (Greenbaum and Kyng, 1991), 'Participatory Design: Principles and Practices' (Schuler and Namioka, 1993), and the Routledge International Handbook of Participatory Design (Simonsen *et al.*, 2013). These theoretical developments will be discussed more in depth in the next chapter, as they underpin this thesis.

This section has shown the Scandinavian PD practice as an approach where design researchers work to develop methods and tools to engage with users in early design activities in order to design systems that improve their skills. In recent days, PD approach has evolved into the more active participation side of the user involvement in the design of products, services, systems, and more recently, public sector services and social innovations as well as getting closer to human-centred approaches (E. Sanders and P.J. Stappers, 2008). PD studies have been concerned with developing new methods, techniques and tools to support the involvement of people in the design process as a response to the reconceptualisation of the designer and rejection of traditional approaches to design.

2.2.5 Human-centred design (HCD) / Design thinking (DT)

This review includes user-centred design (UCD) as a category that may fall under human-centred design and DT, and thus this section is reviewed in via a designerly mindset and approaches that continued to develop in the 1960s, 1970s, 1980s, and 1990s. Although there is no consensus on what DT is in the design discourse (Kimbell, 2012; Johansson-Sköldberg *et al.*, 2013), most of the DT descriptions include the ideas of user-centredness (Hernández *et*

al., 2018). Therefore, this section will look at the main concepts of the shift in design practice from early perspectives of UCD, and DT as the latest level of development of designerly practices.

Early UCD approaches were based on an object-centric perspective, in which a person was defined in relation to an object, where user testing and evaluation were conducted in laboratories in order to make people interpret and use an object in a determined way at the end of the design process. The core idea behind these approaches was to consider human capabilities and characteristics when developing technologies and systems without acknowledging real needs of people and society. These approaches are aligned with the role of the designer as the expert in human behaviours, capabilities and needs based on knowledge in science, engineering fields, human factors and others, where users were one part of the system (Ritter *et al.*, 2014).

As a response to the early UCD, designers have considered acquiring knowledge from 'potential users', who provide information about their needs and preferences, while they evaluate and map reactions with the purpose of devising solutions that can fit the knowledge acquired from users. This response led to the emergence of a number of approaches and a range of methods for studying people and testing prototypes to involve people in the human-centred design process. In this context, human-centred design (HCD) is used in order to distinguish from the early UCD as well as from the focus on systems design, where it was originally developed as presented in the following paragraph.

Through the 1980s, HCD became widely popular with Donald Norman's seminal textbook 'User-Centered System Design: New Perspectives on Human-Computer Interaction' (1986), where he maps out the initial prescriptions for good design and usable products. The textbook draws on the perspectives from multiple authors, who discuss pluralistic perspectives and traditions, acknowledging the participatory movements in community design and user participation in order to develop the field of human-centred design. The textbook, referred as a 'book of questions', prompts ideas on how this field could have been further developed, which represents a shift in design thinking, although also brings some of the rigidity of early UCD approaches to the discussion. A brief discussion on this shift in thinking is discussed below.

In the first chapter of the textbook, Kristina Hooper makes an analogy between architectural design and systems design, drawing topics that offer insights into developing usable systems and prompting insights to the UCD approach. Additionally, she prompts the question of who the user studied in the design of interfaces is. In the period of shifts, a detailed response to this question is presented by Johan Redström's paper (2006), who discusses the shift from the object-centred design that turns people into end-users to potential users in the centre of the design process, in which they are invited to assist with what the design will be (Steen *et al.*, 2004; Redström, 2006).

In the third chapter of the textbook, Donald Norman briefly discusses the quality of human-computer interaction regarding systems that are easy to use, easy to learn and enjoyable. He draws on Illich's ideas (1973) that systems as tools should provide a strong sense of understanding and control over the operations that are being performed. Norman argues that could be achieved with the design of tools that make visible their operations and assumptions. He provides general ideas on what he calls 'prescriptions for design', which he later develops in his work 'Psychology of everyday things' (1988) and 'Design of everyday things' (2002), highlighting his concerns about user interpretation of tools as more than easy

to learn and use as well as enjoyable, i.e. in terms of usability and user experience. These concerns are also covered in Johan Redstrom's paper (2006), in which he discusses the relationship between users and objects, providing a background for the shift of tools focused on function towards communication and experience, where design started to move beyond just products and services.

In summary, Norman's prescriptions led to the development of an HCD process that starts from the needs of users before implementing a system, letting the ideas about the interaction drive the interface from the user perspective within a continuous iteration of testing and refining process. This was later developed as the iterative HCD cycle, i.e., a cycle involving observation, idea generation, prototyping and testing. From the 1990s onwards, there was a significant development of HCD and iterative methodologies focused on the expertise of designers applied in industry and business. This helped to consolidate the application of HCD principles and approaches in practice, theory and education (E. Sanders and P.J. Stappers, 2008).

In practice, the company IDEO, a merger between three big design companies, started to apply design to tackle complex problems in areas that the company was not originally focused on, such as business, education and healthcare. IDEO started to showcase through multiple media their approach to design, labelled as design thinking, to differentiate from traditional design approaches (Brown and Wyatt, 2010). In theory, the emergence of a number of journals of design research, theory and methodology (Cross, 2001), textbooks that began to generalise DT concepts (e.g. Lawson, 1980; Rowe, 1987), and a series of DT symposiums helped to disseminate DT processes, models and skills in education and practice (Cross, 2018). From this period onwards, tools for DT and co-creation became more apparent. In 2013, Donald Norman (2013) revised and extended his work, adding a new chapter, where he acknowledges design thinking, what he initially called 'Human-centred design'⁶.

In contemporary design, a number of DT toolkits have been developed to enable citizens to engage in policy-making and public sector design by private design consultancies and public initiatives, such as IDEO and MindLab in Denmark. DT tools have received special attention as they are essential to enable stakeholders to innovate, articulate and orient design and development processes (Hernández *et al.*, 2018). However, these tools and toolkits are often composed by popular methods used by design and business professionals, which might neither match with creative skills of 'lead-users' and public engagement practitioners (Johansson-Sköldberg *et al.*, 2013) nor sufficiently account the reality of policy contexts (Clarke and Craft, 2019).

To sum up, this section presents the HCD practice as an approach where designers conduct research on potential users, who are sources of information, to understand their experience as research inputs for the development of desired outcomes in public and private services, processes, products or experiences. The user research is conducted at early design stages through the use of methods to capture user needs and emotions as initial requirements for design at a later stage. A review of current discussions highlights the importance of tools for engaging with stakeholders and organisations. However, it also shows that there is a need for more appropriate tools to engage with stakeholders in specific contexts, such as tools for policy-making.

⁶ https://jnd.org/rehtinking_design_thinking/

2.2.6 Overview of design traditions

Having historically reviewed the main participatory design practices that emerged in the 60s and 70s, the following subsection will build on key characteristics and concepts of these four traditions, expanding and contributing to the discussion that shapes contemporary participatory design and co-design practices, and highlighting patterns and trends identified.

Control of the creative process

From traditional design practices, where users had no voice, to the involvement in the design process, each design tradition has proposed different relationships. On one side of the spectrum, open designers have been giving control of the design process to users by democratising means of production, materials, methods or tools to develop their own solutions (e.g. Global tools, Memphis, Multimedia authoring tools, Leapfrog tools, 3d printers). At the other end, user-centred and participatory designers have often kept the involvement of users to the early stage of design, where they provide experience, ideas and knowledge for the development of solutions that fit users' expectations and skills. Community and public sector design lies somewhere on this spectrum, where designers lead the KE process (bason, 2010) or citizens lead creative engagement processes that do not involve designers or (many) designerly methods.

Roles of designers and users

Designers and users play different roles in different design traditions. In OD, toolkits and materials are provided to lead users, enabling them to design and improve their situations in a specific domain, where designers are not recognised in the process. In CD, planners or trained facilitators set communicative spaces and facilitate creative processes through the use of methods, techniques, and tools to engage citizens and stakeholders in public decision-making processes. In Scandinavian PD, designers as consultants provide materials or tools for prototyping, enabling users to take an active part in improving their working practices. In HCD, designers as experts use methods to extract contextual knowledge and experience from passive users to provide inputs to new designs.

Engagement mechanisms to involve people in design and decision-making processes

In OD, lead users or creative citizens design and test custom products, systems and services, often through the use of toolkits or online platforms. They collaborate through a complex network, sharing their innovative designs to a group of people interested in learning more about a specific area of expertise. In CD, facilitation approaches and methods are used to engage citizens in a local initiative to improve their lives through the use of public spaces, creative acts such as exhibitions and photography, and facilitation. In Scandinavian PD, designers provide prototyping tools and resources to workers, acting as consultants in order to facilitate the development of technologies that match with participants' skills. In HCD, designers use methods to extract information and knowledge from potential users, in order to provide data to develop tools that fit with their knowledge.

As this section will focus on reviewing the involvement of designers and non-designers in the design practice (2.2), the table below summarises each tradition as it was initially practised, looking at the design space, objectives, designer roles, relationships with people, and objects used in practice. A further discussion on the current state of practices is discussed in the following section.

Table 1. Overview of contemporary design practices

Traditions Characteristics	Open design	Community design	Cooperative design	Human-centred design
Design space Where does the collaboration happen?	Individuals situated in complex networks such as online platforms	Workshops, forums, dialogues in public spaces	Technology laboratory, ad hoc spaces	Laboratory, contextual workplaces
Design objectives Why do designers and/or non-designers collaborate with each other?	Improving their own situations and practices	Community building, Consensus building through the inclusion of multiple voices	Understanding and improving working practices	Understanding needs and preferences to create better designs
Designer roles What is the role of designers?	Professional designers may or may not be involved in the process	Advocate planners or facilitators	Designers as consultants and designer of methods and tools	Designers as experts
Role of participants What is the role of non-designers?	Lead-users, end-users, and creative citizens	Active citizens or advocate planners	Users as experts / partners	Users as informants
Engagement enabled by approaches, methods and mechanisms	Kits, DIY materials, and tools	Principles and methods for facilitation	Methods and tools for prototyping and participation	User research methods and tools

2.2.7 Evolution of traditions toward co-design and participatory design

All design traditions have influenced one another, turning into an area of knowledge that embraces diverse processes, tools, organisations and roles in a collaborative practice often called co-design and participatory design (PD). Defining PD and co-design is not a simple task to do, as many combinations of practices keep emerging as co-creation becomes widespread. As a starting point, **this thesis considers co-design and PD as a subset of co-creation and knowledge exchange (KE), i.e., an act of collective creativity shared by two or more people** (E. Sanders and P.J. Stappers, 2008; Cruickshank *et al.*, 2012). As this chapter aims to identify the trends, patterns, and likely directions for future research, this section will look at current design stances and debates in co-design and PD, considering the previous section as a framework to guide this discussion.

Tuuli Mattelmäki and Froukje Visser (2011) propose four co-design directions from the point of view of the designer actor, where (1) the designer extracts the expertise from users, analyses the information and uses in the design process; (2) the designer provides tools to support users in expressing their ideas and experience that can be interpreted; (3) designers and users exchange ideas and collaborate in the collective creation; (4) designers and design researchers support and facilitate a collaborative process of stakeholders. They support each of these directions with five case studies, where designers facilitate creative activities with participants by using designerly approaches, such as mood boards with school kids and game boards and game rules with public organisations, drawing ideal products with users, or brainstorming with university students and staff.

As these co-design directions do not consider KE processes that use OD approaches, the following paragraphs differentiate co-design from these directions by also considering other creative practices in the literature that emerged from different traditions. These paragraphs will consider designers conducting designerly processes (e.g. brainstorming, mood boards) with non-designers as well as creative processes that use elements associated with participants' everyday life experience, such as icons representing furniture and items of day-to-day life (Lee, 2008) as two different design practices. **In this thesis, the use of designerly and controlled approaches to engage with participants is considered PD, whereas the use of daily elements that enable participants to be creative in their own way is called co-design.**

Many overlapping participatory practices have emerged from 2000 onwards. These emerging approaches are often called co-design, where the design process is kept partly open to participants (Björgvinsson *et al.*, 2012b), using designerly elements to collaborate with people. For example, a group of precursors of Scandinavian PD has moved their PD practice towards CD and social innovation, where KE happens between users and experts and is aligned with the advocacy of marginalised communities. In one of their projects, the team engaged with a hip-hop organisation through designed elements to explore the urban landscape, such as a mobile game (Björgvinsson *et al.*, 2012b).

Other PD approaches have been more influenced by human-centred design, where designerly mindsets and approaches are applied in KE processes. Four PD practices are exemplified as follows.

- 1- In the first example, the emerging transformation design discipline combines PD practices and HCD approaches to explore economic and social issues from healthcare to supply chain logistics (Burns *et al.*, 2006).
- 2- A second example of practice building on principles of DT/HCD and citizen involvement is presented by Bason (2010), where the process is 'orchestrated' by a manager to co-create public solutions and innovation in the public sector, but it does not focus on increasing democratic participation, like in community and cooperative design.
- 3- In the third example of PD practice, participants are invited to express their experiences in a design process, where designers creatively engage users in an imaginary world to develop ideas based on participants' experiences (Mattelmäki *et al.*, 2014).
- 4- A fourth example is emergent service design, where mock-ups, prototypes, storyboards, and enactments are used as tools and methods employed in the practice (Mager, 2009).

In these PD practices, there is an increasing attempt to make use of participation methods, tools and approaches more flexible to explore design challenges and situations that contain a great deal of uncertainty (Bødker *et al.*, 2000; Ehn, 2008; Giacomini, 2014; Mattelmäki *et al.*, 2014).

In contrast, co-design practices — originally applied in the public realm and aligned with the advocate planning and more open and democratic design processes — started to be in the spotlight of design studies (David *et al.*, 2013). These practices are recognised in CD, HCD and OD literature as processes that do not derive from the Scandinavian PD but have been influenced and developed in parallel to it. Co-design has more influences from OD approaches, which takes participants a step forward from HCD approaches. Leon Cruickshank *et al.* (2013) recognise co-design as a creative practice in the public sector, which varies from being close to consultation and information gathering to facilitating

people in generating their own ideas and solutions. Along the same lines, Yanki Lee (2008) states that co-design is initiated by people and invites designers to work for them, proposing new roles for designers in co-design processes based on a proposition similar to Arnstein's framework (1969).

Joseph Giacomini, director of the Human-Centred Design Institute at Brunel University, recognises von Hippel's work as a co-design process (Giacomini, 2014). von Hippel's work in innovation studies (2001) focuses his work on lead users, people who initiate design processes to change their own situations, where professional designers are not recognised in the process. A similar co-design approach in open innovation is described by Halse et al. (2010), where they felt disconnected from participants, who sketched and tried out possibilities in a workshop with tools and methods to produce a quality result within a half-day or full day. They describe their co-design approach in 'design laboratories' as:

'staged to re-think and re-construct established routines and networks it needs something like a laboratory to ensure conditions in which what is generated can grow without being overwhelmingly contested by the often-harsh environment of everyday realities.' (Halse et al., 2010, p.19)

Following these perspectives, PD follows a creative practice, where designers invite people to participate in a partly open design and decision-making process to improve their life and work situations. In these practices, design researchers and practitioners are still present in setting the stage and facilitating stakeholders to work together towards a desired outcome, i.e., design processes that are created by design experts to enable people to participate in the design and decision-making of projects, policies and programmes that affect their lives. Although citizens are involved in the design process, designers are still the ones who know which creative process, methods and techniques to use to explore a situation. PD processes can sometimes be difficult for non-designers to understand and follow, trapping them in a situation that is not common for them, not leaving enough space left to act, improvise and contribute with their living and working expertise.

As a generic definition that encompasses all previous examples, co-design could be described as:

'people come together to conceptually develop and create things/Things that respond to certain matters of concern and create a (better) future reality. People come together despite, or because of, their different agendas, needs, knowledge and skills. The task may involve academics, practitioners and communities of place/interest that work together in order to make sense of certain situations and conceptually develop ideas into solutions. People involved in co-design may or may not be trained/professional designers, at least in the traditional sense of the term (such as graphic designers or product designers).' (Zamenopoulos and Alexiou, 2018, p.12)

In other words, co-design processes are initiated by anyone interested in improving their situation and may or may not involve designers to collaborate in their KE processes. In co-design processes, people generate their own ideas and solutions in non-designerly ways by using tools, toolkits and methods that might not address the particular problem space but provide scenarios and principles to inspire and guide them to creatively design their own spaces and facilitation approaches. Examples of tools, toolkits and handbooks used in co-

design are the Community planning handbook (Wates, 2000), creative facilitation (Tassoul, 2009), and Leapfrog tools⁷.

This section presented current design stances and debates in co-design and PD literature, situating the areas of knowledge in which the thesis seeks to make a contribution. The following section summarises key findings in the review, highlighting trends and patterns in the landscape of practice presented in this chapter.

2.3 Trends, patterns, and research directions: Bringing key concepts forward

This review presented a collection of design practices aiming at improving current situations in different aspects of work and life, such as industry, business, urban planning, healthcare, public policy. Co-design and PD practices have been influencing one another since the rejection of rational and traditional design processes in the 1960s. What stands out in this parallel development is the overlapping activities and roles people play in these practices, such as design spaces, facilitation, participation approaches, and tools as presented in the following subsections.

2.3.1 Patterns: Engagement roles and activities

Co-design and PD practices often happen in collaborative spaces like private or community buildings and controlled environments, where workshop-like events take place. An exception to these physical spaces is exemplified in Cara Broadley and Paul Smith's research (2018), where different steps of the process of co-designing tools were conducted via telephone, remote probes, email contact, digital feedback, video conferencing session, and informal conversations due to geographical challenges, which required mobile and portable approaches to deal with limited accessibility. Nevertheless, workshop-like events are designed to enable people to collaborate, cooperate, connect and promote the exchange of ideas, expertise, skills or experiences in order to meet an agreed objective. The process of designing spaces involves producing appropriate resources, tools and approaches (Thomson, 2007; Cruickshank *et al.*, 2012), considering the aims, objectives, and audience of the activity to produce an infrastructure for a common action (Zamenopoulos and Alexiou, 2018). This role of engagement that involves setting the stage for KE activities is assigned to an expert in creating design spaces (Botero *et al.*, 2010) – also known as design-games in PD literature (Ehn, 2008) – to enable collaboration for the emergence of new designs.

The implementation of workshop-like events involves enabling conversations and interactions between participants through the use of facilitation techniques, approaches and principles in order to make sure everyone can contribute to an engagement activity, guiding them to a desired outcome. This role of facilitator requires the use of principles, like avoiding jargon and adopting flexibility (Wates, 2000), mechanisms, actions and techniques that have specific functions, such as energising participants and generating ideas (Tassoul, 2009), and approaches developed in and on practice (Forester, 1999). The role of facilitator has been previously discussed in co-design and PD literature. In CD, facilitators have played an essential role for building consensus and developing communities (Davidoff, 1965; Forester, 1999; Lane, 2005; Sanoff, 2008). In PD, facilitators encourage a broad perspective of participants, ensuring participants can follow a discussion and equally contribute to it, for instance, in future workshops (Kensing and Madsen, 1992) and in social innovation in recent

⁷ Leapfrog tools www.leapfrog.tools

years (Light and Akama, 2012). In DT, designers are perceived as a coach and facilitator, and less as a director of a KE process (Bason, 2010).

Participants, users, citizens, stakeholders are the experts in the design space, who contribute with their knowledge and expertise to PD or co-design processes. They can be the most influential people in the project (e.g. managers, policymakers), public sector practitioners (e.g. health and social care professionals), people affected by the project (e.g. YP, local communities), or have an interest in participating in a matter of concern. Zamenopoulos and Alexiou (2018) classify these groups of people as open or closed groups that effectively constitute a community of practice (Wenger, 1998), representatives of a community, community of (potential) users or beneficiaries of KE outputs. These engagement roles and activities will be explored more in depth in Chapter 4, which will look at how tools and engagement activities are understood in the contemporary design practice of PD and co-design.

2.3.2 Trends: Tools

Tools have become a trend in co-design and PD practices, although they are not seen in the same way in different design traditions. In HCD and DT, tools have been seen as the outcome (e.g. product, system) or a toolbox of popular designerly methods that anyone can use to create innovative solutions like following a cookbook recipe, although they require knowledge and skills from those employing it in their design practice (Johansson-Sköldberg *et al.*, 2013). Similarly in CD, a toolkit is seen as a set of methods^{8 9}, but also as charts, post-it notes, sticky dots, pens and models (Wates, 2000). In OD, toolkits for supporting lead-users / end users in design and innovation in a specific area have been used to combine people's expertise and the generation of ideas that are not limited to existing parts or designs of manufacturers. In PD, there are two perspectives in which tools have been defined. On the one hand, tools are components that are used in order to support designerly approaches in specific PD stages, which are aligned with the DT/HCD process (E. Sanders and P.J. Stappers, 2008; Sanders *et al.*, 2010). On the other hand, tools are seen as instruments to support techniques and are considered as part of the method, where a method is a set of principles and guidelines for conducting a design process, and a technique is how to carry out specific activities (Bratteteig *et al.*, 2013). The latter PD and OD definition of tools are more aligned with this PhD thesis and co-design as discussed in Section 2.2.7.

Considering tools as instruments to support any co-design and PD techniques, this thesis will use the term 'knowledge exchange tools' as a way to distinguish them from designerly tools used in DT and Sanders' definition of PD tools. KE tools can be used for both designerly tools as well as tools from other design traditions. There are a large variety of tools, toolkits, handbooks for multiple applications available to support the practices of designing workshop-like events in the literature. The Toolbox Toolbox website¹⁰ presents a compilation of tools designed by many organisations such as IDEO, Mindlab and Nesta. However, prescribed or generic tools and techniques alone do not ensure a good exchange of knowledge of those involved in workshop-like events (Cruickshank *et al.*, 2012). The challenge is to determine the appropriate tools for supporting creative activities in design

⁸ National Assembly for Wales Assembly Communications Public Engagement Toolkit www.assembly.wales/public_engagement_toolkit_2014.pdf

⁹ The Manchester Community Engagement Toolkit http://www.manchester.gov.uk/download/downloads/id/234/community_engagement_toolkit.pdf

¹⁰ The Toolbox Toolbox <http://www.toolboxtoolbox.com>

processes (Brandt *et al.*, 2012). The concept of tools will be explored more in depth in the following chapter, which will look at how tools are understood in different design traditions.

2.3.3 Directions for future research in the field

Having highlighted the patterns and trends identified in the literature, this chapter has shown that KE tools have been used to support methods and activities in many design practices. Looking at the engagement and roles and activities, KE tools can be used for supporting the practice of designing spaces, facilitating creative workshops, and assisting experts to express themselves and contribute to a matter of interest. However, many of the available tools assume particular skills, expertise and creativity on the part of the users, such as the IDEO tools. Previous studies have shown the need for engagement approaches tailored to particular contexts and needs, for example, adapted approaches and tools to engage people with communication impairment (Wilson *et al.*, 2015) or children (Thomson, 2007). One approach to designing better tools and toolkits is to improve existing ones (Cruickshank *et al.*, 2017), creating new versions of tools that fit practitioners' needs and are appropriate for specific contexts. In this context, the present scenario and concern lead to the following research question: **How can knowledge exchange tools be improved?**

As discussed in section 2.2, PD fundamentally rejects the assumption that the goal of tools is to automate the skills of people, rather seeing it as an attempt to give better tools for doing design activities. It assumes that those who carry out these activities are the ones who know best how to improve their practice. Although such tools were seen as part of the professional process of system design in the early years of PD, it has become accepted that KE tools are part of many different other design practices (Bratteteig *et al.*, 2013), bringing PD closer to OD traditions. Improving KE tools through an open and participatory practice seems to be the way to seek answers to the research question.

Additionally, PD and HCD communities have started to move their efforts to design for social innovation and the public sector, starting to advocate for the needs and concerns of local communities (Björgvinsson *et al.*, 2012b; Manzini, 2015) as well as supporting community participation in public decision-making (Saad-Sulonen, 2014). However, HCD approach does not seem to be the way to seek answers to the research questions, as Norman and Drapper (1986, p.2) state that HCD fundamentally 'do not wish to ask how to improve upon an interface to a program whose function and even implementation has already been decided'. Nevertheless, the theory presented in HCD practice about good design and usable products can be used as a source of inspiration to develop a way to improve KE tools and develop best practice, providing perspectives on how to shape the interaction between humans and tools.

This PhD research will look at how engagement practitioners can improve tools to develop their practices of designing, facilitating and doing KE activities towards desired outcomes in order to change their existing situations. The following chapter will look more in depth at the HCD, PD and OD theories used in improvement and design of tools to develop a theoretical proposition to answer the research question that emerged in this Chapter.

2.4 Chapter summary

This chapter presents the definition of the term 'design' and the emerging design practices that underpin this thesis. Firstly, it focused on defining design as a process, practice and tradition, providing an open definition to support this chapter. Secondly, it focused on the shift of practice in the 60s onwards, providing the reader a background to understand the design landscape towards co-design and participatory design practices, where people started

to be involved in the design process, as opposed as the professional designer at the centre of the process. Thirdly, it traced the trends and patterns in current design literature, providing a landscape of practice in which this thesis seeks to make a contribution and leading to a focused research question.

In Section 2.2 the discussion began with the origins of designers and their initial role in the industrial period, then explores the needs and demands of the society that calls for the reconceptualisation of professional designers (2.2.1). This call led to a shift from a designer as the person who determined what was best for society to a person who included society in the design process to create better solutions to improve work and life, leading to new approaches and traditions in architecture, planning, and design. In OD approaches (2.2.2), the growth of the DIY industry, democratisation of new technologies and groups of radical designers enabled people to create and design improvements, and test propositions through the use of cheap materials, tools and toolkits, which was later fuelled by the emergence of virtual communities and digital technologies. In CD (2.2.3), the increasing citizen participation in public decision-making was promoted by facilitation approaches and methods to engage communities in order to build community consensus in architecture and planning. In Scandinavian PD (2.2.4), industrial workers were involved throughout the development of computer systems to enhance their practice through the use of tools and prototypes in workshops, where they were considered as skilled practitioners who had knowledge in improving their workplace. In HCD (2.2.5), people started to be included as sources of information, where they provided knowledge and expertise to designers to use as inputs into the early stages of the design process. Donald Norman, the father of HCD, proposed principles to adopt and engage in HCD processes, which later became widely used in other domains under the name of design thinking.

Section 2.2.6. presented an overview of the traditions of practice that emerged as a response to the rational design process as a reference for engaging with previous research and current design stances in KE: participatory design and co-design (2.2.7). Section 2.3 highlighted the patterns and trends and directions for future research. As a pattern, this review highlighted the application of workshops in all design traditions as an approach to build consensus, develop designs, understand organisations, etc. As a trend topic in design research, tools have recently come under the spotlight with the popularisation of DT in public and public sector as a way to support the engagement with individuals and organisations.

However, many tools, toolkits and methods available in the literature assume that users have the skills to use them with ease, providing little evidence on what works in practice. The application of KE tools has raised a concern over how to improve tools to fit engagement practitioners' skills and contexts, leading to the research question of this thesis: **How can knowledge exchange tools be improved?** The following chapters will look at existing theories used for designing and improving such tools, providing a theoretical review of the practices involved in the design of workshop-like events, aiming at building a theoretical proposition to answer this thesis research question.

3. Designing and improving tools for Knowledge Exchange (KE)

As shown in Chapter 2, PD and HCD have applied tools that match the needs, capabilities and skills of potential users for whom they are designed. One of the principles of PD involves ‘better tools for workers doing their jobs’ (Schuler and Namioka, 1993). Similarly, HCD principles build around ‘good design’ and designing useful tools that enable users to apply and understand them in a constructive and creative way (Norman and Draper, 1986; Norman, 2013). In OD approaches, tools have been designed to enable lead users to conduct design processes in manufacturing toward better products and services (Von Hippel, 2001). In the same vein, CD has been moving towards self-organised communities, where citizens initiate design processes to improve their lives. Although CD does not focus on designing tools, contemporary PD and co-design studies have been moving the practice of employing tools for social innovation and the public sector to design with communities. Therefore, this chapter builds on these traditions in order to seek answers to the research question: **How can knowledge exchange tools be improved?**

The purpose of this chapter is to examine how existing theory in improvement and tool design shapes and frames how this thesis defines better tools, focusing at identifying improvement mechanisms to develop a theoretical framework for improving tools. This chapter reviews the concept of improvement and tools within the context of design, looking at the definitions of improvement, tools and theories involved in making better tools to enhance the contemporary PD and co-design traditions (2.2.7). Section 3.1 and 3.2 explore the theories and concepts involved in the design of tools, aiming at defining improvement and tools in order to put tool design and improvement on the same page. Section 3.3 explores tool design guidelines and principles in HCD, PD and OD practices seeking to understand how to make better tools. Finally, Section 3.4 discusses and summarises the findings of this chapter.

3.1 Improvement within the context of design

By doing a simple Google search for the term ‘improvement’, it is possible to find out that it is associated with quality improvement, continuous improvement or improvement science. As design in this thesis is not seen as a science but as an intermediary discipline (2.1), this section aims at contextualising improvement within design discourse, looking at how improvement is defined in the literature and at the historical evolution of improvement approaches.

This section frames the concept of improvement within the context of design in three subsections. Section 3.1.1 looks at the definition of the term improvement, discussing the overlaps, commonalities and differences in similar terms used in the design field, such as innovation and adaptation, concluding with the definition of improvement adopted in this thesis. Section 3.1.2 briefly reviews the historical shift in improvement practices in order to align it with the design practices discussed in Chapter 2, setting the scene for the improvement principles that underpin this thesis, discussed in Section 3.3.

3.1.1 Improvement, innovation, adaptation

The Shorter Oxford English Dictionary¹¹ defines the extended meaning of the term 'improvement' as:

[AN empowerment, f. as IMPROVE v.²: see -MENT.]

(...)

3. The action or process of making or becoming greater; (an) increase, (a) growth, development, intensification.

4. The utilization of a person or a thing. Now only, the making good use or taking advantage of an occasion, event, etc.

5. The action or process of making or becoming better or more valuable; the state of being better or more valuable; the state of being better

6. An act of making or becoming better; an addition or alteration which increases the quality or value of something.

7. The production of something better than something else; a result of this. Foll. by on, upon.

Langley et al. (2009, p.16) in their book 'the improvement guide' states:

Improvement has meaning only in terms of observation based on given criteria. In other words, improvement is a useful concept when it is defined by characteristics such as faster, easier, more efficient, more effective, less expensive, safer, cleaner, and so on. Sometimes it is enough to observe the impact of a change on these characteristics, but usually it is best to document the impact (collect data).

Looking at these definitions and considering design as a process of changing existing situations into preferred ones (2.1), both improvement and design are considered as a process of bringing something into a more desirable state as well as an output of the process defined by better outcomes. Considering the landscape of practices in which this thesis seeks to contribute to knowledge, improvement is aligned with making better tools that fit skills of engagement practitioners to support their design practices of planning, facilitating and exchanging knowledge in workshop-like events. These practices will be discussed more in depth in Chapter 4. The following paragraphs will look at improvement and other terms used in the design discourse, such as innovation and adaptation.

Improvement and innovation can be distinguished in terms of scale or order of magnitude. According to the Oxford dictionary, improvement is defined as an action of making or becoming greater; increase, or a growth, development and intensification, where the improvement (noun) is better than the previous version. For example, a car is an improvement on a cart as a result of an action of improvement (development) of the cart, whereas innovation differs significantly from the previous product or process, in providing a solution that does not yet exist. However, improvement and innovation are not mutually exclusive, as innovation can be achieved through a series of minor improvements in the design, resulting in a significant difference in the final product or process. The scalability and continuous improvement concepts as means to describe the relationship between innovation and improvement are covered by Keathley et al. (2013) and OECD's definition (2018) as follows.

¹¹ Oxford shorter English dictionary CDROM, 1997

The Organisation for Economic Co-operation and Development (OECD) innovation guide used in business, but applicable to all sectors, defines innovation as:

‘a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)’ (OECD, 2018, p.20).

In the OECD guide, innovation is seen as a process and as an outcome, which has similarities to the definition of design (2.1). Although these definitions of innovation put design in the same framework, (business) innovation activities are broader and encompass informal or systematic ‘developmental, financial, and commercial activities undertaken by a firm that are intended to result in an innovation for the firm’ (OECD, 2018, p.67), where design is considered as one type of activity relevant to innovation.

Keathley et al. (2013) define the term innovation as adding value, and as an innovative solution that improves the process and/or its output. However, they highlight that not all improvements are innovations, and vice-versa, but most of the innovations are intended as improvements. Their innovation definition covers the use of continuous improvement activities of an organisation, which do not involve new information or knowledge, and refer to improvement activities as adjustments, servicing, routine updates, such as product fixes, tweaks and repackaging. This definition of improvement is contrary to Langley’s (2009), as he considers the acquisition of subject matter knowledge essential for developing changes that result in improvement. Keathley’s definition also covers the ideas that are ‘ahead of time’, which are expected to create value and improve the customer’s situation but are pending approval from customers. This stage of validation seems to be a key for innovation as well as for improvement, as both require an agreement from the viewpoint of those affected by a change.

Although these definitions focus on the private sector, they are not confined to it. Innovation and improvement have different concepts when used in public sector and in terms of human gains. OECD’s definition constantly mentions the adverb ‘significantly’ in the innovation guide. However, how extensive does the change have to be for it to be considered as innovation? Most of the innovation and improvement literature is derived from product development, where the innovation in technology can be measured and observed, whereas the innovation in public service is more ambiguous, as the innovation is usually not physical artefacts (Hartley, 2005). Innovations can also contribute to improve societal goals, such as employment, health, public engagement, or provide assistance to solve and influence societal wicked problems. However, it requires a different concept to assess innovation.

Greenhalgh et al. (2004, p.40) suggest that innovation in healthcare must be perceived as new by a proportion of stakeholders, directed at improving health outcomes, and may or may not be associated with new health technology. This way of evaluating innovation in healthcare is similar to Keithley’s innovation validation in business where, if the customers consider that something is adding value, it is innovation. This socially constructed perspective is a useful approach to determine improvement and innovation of design outcomes.

Although improvement and innovation have been used synonymously, this is not always the case. For instance, the use of cameras with facial recognition in public spaces by a government to improve security in many countries is clearly an innovation. However, it infringes citizens’ civil liberties, as it can be used to control society in the future. Considering the definition of improvement as a positive change to citizens as stakeholders affected by

this change, the previous example cannot be considered an improvement to citizens, as it might not derive much validation from those affected in the area covered by this innovative system.

In summary, it is possible to say that although innovation, improvement and design are closely linked, there are a few instances where they differ. Additionally, innovation and design have their own field of studies, where improvement is part of both fields. However, in design studies, improvement is better understood as positive changes in work and life conditions in terms of human development rather than improving business and technologies. This shift in the approach from improvement focused only on technology to an approach that considers improvement in real life situations is further explored in the following section.

Another important concept that needs to make a distinction in this thesis is the concept of adaptation. Improvement practices involve identifying issues and proposing lasting changes to a framework to make a practice better in a deliberative way within an iterative cycle (Langley *et al.*, 2009), while adaptation practices happen in a non-deliberate manner to fit it better to an existing framework (De Waal and Knott, 2013). Although there are some overlaps on what constitutes improvement in the types of tool adaptation proposed by De Waal and Knott (2013), some forms of adaptations do not necessarily lead to improvements, as highlighted by the authors, based on a participant's statement about a reconstructed tool. For example, people can adapt the words used to explain an activity to suit an audience with learning disabilities, but the structure of the activity remains the same. Furthermore, Hartley (2005) highlights that innovation may include reinvention or adaptation to another context, location or time period. Therefore, innovations can be adaptations or improvements, but adaptations do not have the same meaning as improvement.

Without going into more detail in this discussion, as the understanding about adaptation, improvement and innovation varies in the literature, people can deliberately design new ideas or do quick fixes to improve a situation as well as non-deliberately innovate, but only ideas that are perceived as useful by those affected by the solution are considered improvement and/or innovation. The following section discusses this deliberate improvement activity and approaches, looking at the historical shift in the improvement approaches in order to put improvement and design practices on the same page.

3.1.2 Approaches to improve work: the historical shift from 'transferring improvements to' to 'developing improvements with' individuals and organisations

Improvement has an everyday definition, which is making something better, requiring that a positive change occurs. However, the understanding of how the approach to improvement is treated in the literature has changed over time. To better understand the concept of improvement, this chapter looks at the historical development of improvement approaches, and how design engages with the concept of improvement. Historically speaking, work improvements have been achieved through trial-and-error approaches, where people propose a change to a situation and see if it improves by tracking records of the change. Initially, improvement approaches were focused on designing work organisation to increase industrial efficiency in the early nineteenth century, where the proposed changes and the knowledge acquired were restricted to management teams, and technological improvements were implemented in the workplace. However, this scenario started to change in the mid-nineteenth century, when participatory approaches to improvement started to emerge, where workers began to get involved in developing improvements in working environments, as discussed in Chapter 2.

Work design approaches to improve labour can be traced back to early nineteenth century during the Industrial Revolution, when Frederick Taylor, Frank Gilbreth and their successors proposed the application of scientific methods to improve productivity in industries, in which knowledge was documented for further training and dissemination (Colton, 2000; Singh and Singh, 2012). These modern approaches to improvement were focused on increasing working efficiency, where knowledge was restricted to management teams, while minimising the possibility of human development in terms of creative abilities to improve working practices. After the Second World War, these improvement approaches were exported first to Japanese industries, and later spread to Europe and the US across fields such as healthcare and the public sector (Singh and Singh, 2012), becoming known as quality improvement or improvement science in the present day. Twentieth-century industrial approaches to improve work based on scientific methods and Plan-Do-Study-Act (PDSA) iterative cycles (e.g. Lean improvement, Six Sigma) communicate improvement through knowledge transfer, where improvements developed by experts are spread and adopted by individuals within organisations or communities.

However, an alternative approach to improvement started to emerge, led by John Dewey and Kurt Lewin's ideas and efforts toward democratic participation (Adelman, 1993; Coghlan and Brydon-Miller, 2014). This approach is based on Lewin's 'spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action' (Lewin, 1946, p.38) to implement positive change, and Dewey's model of enquiry to integrate science and social practice (Adelman, 1993). Lewin's main concern lies in raising the self-esteem of minority groups, assisting them to overcome problems caused by exploitation and colonisation through the development of intergroup relations (Lewin, 1946). His development of social relationships in the late 30s in industries and communities demonstrated gains in productivity and sustainable cooperation, showing that there was an effective alternative to autocratic improvement approaches (Adelman, 1993). However, these radical ideas remained largely untried until the early 1950s, when members of the Tavistock Institute of Human Relations in the UK put these democratic ideas into practice.

Members of the Tavistock Institute decided to change traditional improvement practices, putting forward an approach that enhanced productivity as well as human satisfaction in the workplace (Mumford, 2006). They believed that work design projects should not only attempt to increase knowledge, but also improve work situations in human terms. The Institute appears to be the first organisation to put Dewey and Lewin's models into practice through the development of an approach called 'socio-technical' (Mumford, 2006; Coghlan and Brydon-Miller, 2014). In this approach to improvement, technology was not the driver in the implementation of working systems; rather, equal attention was paid to workers' satisfaction and productivity in the workplace.

Although the socio-technical approach failed to pay attention to human requirements as the researcher perspective remained in the centre (Bannon and Ehn, 2012), it was seen as a means for improving the skills of workers associated with new technologies. This idea became the core of Scandinavian participatory design and other areas, such as ethnographic approaches to design (Baxter and Sommerville, 2011). As the socio-technical approach became part of the Scandinavian participatory design, researchers introduced a strong focus on local needs, working with local unions to develop a more democratic approach to real needs (Bannon and Ehn, 2012), instead of focusing on researchers' requirements, as in the socio-technical approach, and on production of knowledge for further training and dissemination, like in traditional improvement approaches.

Considering design as the process in which people devise courses of action aimed at changing existing situations into preferred ones (2.1), improvement can then be defined as **an activity that consists of a cycle of critical observation, creative design inputs that lead to agreed positive changes in current situations** (3). In this activity, the Lewinian circle of planning, action, and fact-finding becomes the theoretical model to implement improvements, putting design and improvement practices in the same framework. Considering design as a social practice that contains a great deal of uncertainty (Swann, 2002), Lewin (1946, p.35) argues:

'In a field that lacks objective standards of achievement, no learning can take place. If we cannot judge whether an action has led forward or backward, if we have no criteria for evaluating the relation between effort and achievement, there is nothing to prevent us from making the wrong conclusions and to encourage the wrong work habits. Realistic fact-finding and evaluation is a prerequisite for any learning. Social research should be one of the top priorities for the practical job of improving intergroup relations.'

Therefore, the evaluation and reflection on the practice of improving tools should be considered as part of the activity that determines which design efforts lead toward the achievement of positive changes to the practice, where criteria for evaluating improved tools are defined by those affected by the proposed changes. This approach aligns with the improvement concepts discussed in the previous subsection.

3.1.3 Summary and discussion

This section looked at the improvement, innovation, and adaptation definitions used within the design discourse (3.1.1) and reviewed historical approaches to improvement in order to find similarities and differences in each approach and contextualise improvement within the context of design.

The findings in Section 3.1.1 can be summarised as follows:

- Improvement and design can be considered as processes of changing something into a more desirable state, as well as the outputs of the process defined by better outcomes.
- Improvements can result in innovation if there is a significant difference in the final results, where those who are affected by improvements validate if there is a significant difference and a positive change
- Improvement is a deliberate process of observing and proposing lasting changes to a design to develop a practice, where adaptation is a non-deliberate process to better fit designs into a practice. Some forms of adaptation do not lead to improvement, although it can be used to produce innovations.
- Improvement in design mainly focuses on enhancing human development and satisfaction and solving local needs rather than improving productivity, business and technologies.

Section 3.2.2 looked at the historical shift from an autocratic work design practice, where improvements planned by management teams were driven by fitting workers to the requirement of technologies to enhance productivity, to a participatory work design where workers' needs and knowledge drive the design of better tools to enhance working conditions. In this participatory design practice, the Lewinian spiral model to implement positive changes and democratic participation became part of the alternative approach to improvements, where socially-constructed evaluation and reflection determine which actions lead to improvements in current work and life situations.

3.2 Defining tools

The term ‘tool’ has been used in a variety of ways from a hand or craft tool to computer artefacts in PD and HCD literature, or even used interchangeably with methods or alongside each other due to the popularisation of toolkits for creativity and innovation (e.g. DT tools and methods).

Firstly, this section differentiates the terms: methods, techniques, skills, tools and toolkits, to make clear the terminology used in this thesis. Besides the interchangeability of the words ‘methods and tools’ in HCD and DT ‘grey’ and academic literature, the terminology used in this chapter is presented as follows:

- **Methods:** A coherent set of principles, guidelines and tools for how to conduct a design process (Bratteteig *et al.*, 2013) . For example, methods to conduct design research, to build communities, to engage with young people.
- **Techniques:** Specific ways to perform an activity (Bratteteig *et al.*, 2013) and how tools are put into action (Sanders *et al.*, 2010)(e.g. specific actions to hammer a nail, to engage with children, or to conduct interviews)
- **Skills:** Practiced ability, expertise (e.g. hammering, facilitating, interviewing, drawing, etc).
- **Tools:** Instruments to support techniques and skills (e.g.: a hammer, a sheet of colourful stickers, proformas, templates, worksheets, etc)
- **Toolkits:** A set of tools used for a specific purpose. For example, designers created a series of tools for simulating graphic processes in the Utopia project. These tools could be put into a toolkit for designing graphic technologies.

Secondly, this section contextualises tools in the design shift (2.1) and discusses the concepts of tools in different design traditions using the following structure. Section 3.2.1 builds on Ivan Illich’s ideas to define and distinguish tools from machines, using his concept of convivial tools to initiate a discussion on how tools are understood in design traditions in order to contextualise tools within design practice and to open up the discussion of tools within HCD (3.2.2), Scandinavian PD (3.2.3), and OD (3.3.4) traditions. Section 3.3.5 looks at the tool design shift in contemporary design contexts, setting the scene for further discussion on the aspects involved in the design of good tools (3.3) and new tool design practice (3.4).

3.2.1 Tools within the context of design traditions

This section starts from the definitions of tools presented in the seminal book ‘tools for conviviality’ by Ivan Illich — a critic of modern technologies who inspired new approaches to the design of tools in different design traditions — in order to open up the discussion to what is considered as a tool. Ivan Illich (1973) contributed to the debate in the historical shift discussed in Section 2.2.1. by critiquing institutions and professions that contributed to dehumanisation, influencing design theorists and movements with his ideas. Illich’s ideas inspired Donald Norman in his HCD approach to design tools (Norman and Draper, 1986) as well as the radical design group Global Tools (Catenacci and Galimberti, 2017), and was also considered as part of Ehn’s (1988) Scandinavian PD approach.

Illich defines tools:

“broadly enough to include not only simple hardware such as drills, pots, syringes, brooms, building elements, or motors, and not just large machines like cars or power stations; I also include among tools productive institutions such as factories that produce tangible

commodities like corn flakes or electric current, and productive systems for intangible commodities such as those which produce 'education,' 'health,' 'knowledge,' or 'decisions'. I use this term because it allows me to subsume into one category all rationally designed devices, be they artifacts or rules, codes or operators, and to distinguish all these planned and engineered instrumentalities from other things such as basic food or implements, which in a given culture are not deemed to be subject to rationalization. School curricula or marriage laws are no less purposely shaped social devices than road networks." (Illich, 1973, p.34)

This definition looks interesting in the context of design as an intermediary discipline and as part of any professional practice, since tools can be understood as part of design processes that produce different outputs. Besides that, his main argument lies in the need for convivial tools that give people independence and the opportunity to enrich the environment with their own visions, as opposed to the industrial tools that deny workers the possibility of meaning-making in the world, limiting this task to designers, who impose their visions and expectations on others. He claims that 'people need new tools to work with rather than tools that work for them', inverting the structure of current tools (Illich, 1973, p.23). Most of the hand tools, such as a primitive hammer, allow conviviality, but other tools that are limited to a group, such as dentist drills, constitute an institutional manipulation or contrast with conviviality. However, Illich's broad concept encompasses not only artefacts but also rules, codes or operators, which could lead to the ambiguous use of the term 'tool' as, for example, in HCD approaches.

Donald Norman draws on Illich's ideas of convivial tools that bring pleasure, ease of use and control to users as well as a set of 'rules, codes or operators' to develop the HCD approach. Norman argues that **good tools** enable users to '**apply creatively and constructively, with understanding**' (Norman and Draper, 1986, p.49). He notes that if the concept of conviviality is seriously applied to tools, the design of good tools should make their operation visible. As an example of a good tool, he mentions the Xerox Star, the first commercial computer using graphical user interface (GUI), with an interface emphasising a well-thought-out user model, where the operations are clearly visible. Although the HCD approach focuses on designing convivial tools, the HCD tools used in the approach of designing them are not convivial in terms of giving freedom, as it makes people fit to the process, but in terms of 'rules, codes or operators' (Illich, 1973, p.34) as part of a design language (Ehn, 1988). The following sections discuss this difference of use of the term 'tool' in HCD (3.2.2) and design languages (3.2.3)

Illich's ideal tools seemed aligned with the Scandinavian PD ideal of tools (Ehn, 1988), where the implementation of computer systems prioritised human needs, providing better industrial tools or convivial tools to support and enhance workers' skills. However, tools in PD perspective require specific skills of a group of practitioners, whereas tools for conviviality aim at the idea of one tool fits all, as Illich states:

Tools foster conviviality to the extent to which they can be easily used, by anybody, as often or as seldom as desired, for the accomplishment of a purpose chosen by the user. The use of such tools by one person does not restrain another from using them equally. They do not require previous certification of the user. Their existence does not impose any obligation to use them. They allow the user to express his meaning in action (Illich, 1973, p.35).

The OD ideal of tools lies on a similar path as PD tools. Tools and toolkits may be available for everyone to conduct design activities (e.g. DIY toolkits), but specific toolkits require skills to

use, such as a multimedia authoring tool that enables the creation of learning objects that requires at least PowerPoint presentation skills (Damasceno *et al.*, 2014) or user-friendly toolkits for innovation (Von Hippel, 2001).

From this discussion on convivial tools, all design traditions look at designing tools to support people's needs or skills, instead of designing manipulatory tools that give no freedom to workers. Even though this section presents examples of computer systems, the distinction between convivial and manipulatory tools lies in the degree of independence of operation, not on the type of technology. A convivial tool gives control to people, to understand and creatively apply in their activities, a manipulatory tool controls workers to perform automatic actions. In essence, that is also what distinguishes a tool from a machine, as Lewis Mumford points out:

The essential distinction between a machine and a tool lies in the degree of independence in the operation from the skill and motive power of the operator: the tool lends itself to manipulation, the machine to automatic action (Mumford, 1934, p.10).

Given these definitions, this thesis considers that tools enhance skills and enable people to creatively apply them in their practice, giving them control when conducting tasks. These definitions and other tool concepts are further explored within HCD, Scandinavian PD and OD traditions in the following sections.

3.2.2 Tool concepts in HCD

Tools in HCD can be traced from adapted methods and techniques borrowed from psychology, sociology, human factors and industry or design methods that emerged in practice (Hanington, 2003; Giacomini, 2014; Sanders and Stappers, 2018). These methods and techniques were appropriated to meet the needs and specific purposes in design. For example, ethnography methods in anthropology are conducted during a long period of observation in a community, but ethnography in design is carried out in a shorter period to understand the needs and desires of potential users.

As previously highlighted in Section 2.2.5, HCD has roots in designerly approaches developed in the early 1960s and onwards, which can explain the use of design methods as tools and toolkits in conducting design processes. John Chris Jones, one of the major figures of the design method movement, expressed his rejection of rigid toolkit methods saying:

Rationality, originally seen as the means to open up the intuition to aspects of life outside the designer's experience, became, almost overnight, a toolkit of rigid methods that obliged designers and planners to act like machines, deaf to every human cry and incapable of laughter (Jones, 1980, p.173)

Although other major figures in the design method movement disassociated from it, such as Christopher Alexander and Bruce Archer, design methodologies continued to develop in academia and industry until present times, when DT toolkits are becoming more widespread and popular, besides the growing criticism and small amount of peer-reviewed data on such design methodology for everybody (Johansson-Sköldberg *et al.*, 2013). In summary, the HCD tools are methods designers appropriated and created to support their practice of design that became widely accepted in academia and industry, as discussed in Section 2.2.5.

The concept of tools in HCD involves supporting designerly approaches to conduct research and processes with users. HCD methods can include the use of research tools to support designers in carrying out the iterative design cycles of observation, idea generation, prototyping and testing (Norman and Draper, 1986) or other design processes like IDEO's processes of inspiration, ideation and implementation that are supported by IDEO's method cards or field guide (IDEO, 2003; IDEO, 2015). For example, the IDEO's inspiration stage suggests the use of 'Recruiting Tools' method as a strategy to identify the right people a design project is aimed at.

Considering the design method roots and some participatory design traditions that are part of HCD (Steen, 2011; Björgvinsson *et al.*, 2012a) or influenced by HCD (E.B.N. Sanders and P.J. Stappers, 2008; Sanders *et al.*, 2010), HCD tools can be classified by the design researcher's intentions (Giacomin, 2014) or by a participant's activities (Sanders *et al.*, 2010; Sanders and Stappers, 2018). Joseph Giacomin classifies tools by their intention of informing the design processes with human abilities and limitations (e.g. anthropometric and emotional tools), interacting with people to gather desires and needs (e.g. ethnographic interviews or visual journals), and simulating possible futures (e.g. focus group, co-design, experience prototypes). Elizabeth Sanders and Jan Stappers classify tools by the kind of activities participants perform to enable researchers to explore participants' experience. They classify tools and techniques by what people Say (e.g. interviews, questionnaire and pools), Do (design ethnography), and Make (trigger sets inspired by Scandinavian PD) (Sanders, 2000; Sanders and Stappers, 2018). Although these authors classify tools from different perspectives, both consider tools as research instruments to understand needs, thoughts and feelings that feed into following stages of designerly processes, where designers undertake the analysis and development of initial ideas (E.B.N. Sanders and P.J. Stappers, 2008).

In HCD, there is a difference between tools and objects of design (artefacts, services, computer systems) (Zamenopoulos and Alexiou, 2018). HCD tools can be seen as research tools for design researchers, while objects of design are the 'tools' that should offer conviviality to users in terms of Illich's definition. HCD tools often contain a designerly language composed of data visualisations and information flows that are based on theory and practical experiences and skills used in professional design practice, as discussed in Section 2.1. They are seen as norms and rules for how to carry out a set of activities (Ehn, 1988) instead of as tools for conviviality. Many HCD tools are rigid methods that oblige designers to follow procedures, leaving little space to apply creatively and constructively to engage with users of a future artefact. However, this is an interesting finding because such tools require to be improved to fit the context and needs of those who use them. Tools and objects of design are both considered as part of the HCD approach, where tools involve users at the centre of the design process (2.2.5) known as design for use before use (Ehn, 2008). This approach focuses on designing objects ultimately used as a response to a problem or matter of concern, supporting identifiable users.

Considering ladder of participation concepts (Arnstein, 1969; Lee, 2008), HCD tools can be seen as **tools for consultation**, in which potential users inform designers about their needs and experiences to create **objects of design (artefacts)**. A different concept of tools is seen in the Scandinavian PD, where tools are used to work together with designers, as explored in the following section.

3.2.3 Tool concepts in Scandinavian PD

Tools in Scandinavian PD can be seen as **tools for participation** or **objects for design** (Zamenopoulos and Alexiou, 2018). Tools for participation enable people to have a say in the design process, ensuring that skills were considered as part of the design process. These tools enable people to engage and collaborate in the design task, anticipating and envisioning use of a prototype before the final design by co-creating with users (e.g. building representations, creating prototypes).

Tools are seen as an extension of tacit skills and knowledge. The tool perspective considers the work process as its origin, where the specifications of tools and materials are based on the skills of traditional craft and professionals in the pre-industrial era (Ehn, 1988). Workers are seen as people with tacit skills to perform a task, where tools are used to enhance their original skills to create better products and services. Tools should not try to automate tacit skills but enhance the original skills of those who use tools, since tacit knowledge is centred in personal experience (Polanyi, 1962). In this thesis, the tool perspective considers participation tools used for enabling people to express their tacit knowledge in an area of expertise. For example, in the Utopia project (2.2.4), typesetters expressed their practical knowledge by doing design using tools that simulate graphic settings and operations that reminded them about their experiences.

Tools should remind people about their earlier experiences to work in an appropriate way. In other words, tools should ‘speak’ a familiar ‘language’ to those who use them. Tools not based on a certain language and background of workers are likely to fail. For example, in the Utopia project, researchers had difficulty communicating with workers due to the use of designerly language of data and information flows, but when they shifted to tools for expressing their graphic skills, the communication with workers improved. In this situation, researchers adopted the Wittgenstein approach (1922), where the communication improved because they used a specific design language game that workers could understand. As Snodgrass and Coyne explain:

“We can only understand spoken language in the context in which it is spoken. Ordinary language is wholly entwined in networks of common sense conventions; linguistic practices cannot be separated from concrete ‘life forms’, that is, attitudes, world views and a cultural ethos” (Snodgrass and Coyne, 1996, p.4).

These two highlighted tool concepts can be explained in Heidegger’s approach (1962). The types of tools, which do not speak the language of workers, are ‘broken’ tools or present-to-hand, where they are seen as external objects that are not understood as part of their world. Whereas useful tools, which are appropriate for assisting in a specific design practice and become part of workers’ actions, are known as ready-to-hand. For example, introducing a fishing rod to a tribe which uses a spear as a fishing tool, will prove unlikely to work in their context, as they will not understand a fishing rod as part of their background. According to Heidegger, the fishing rod is a Present-at-hand tool, and the spear is a useful tool, ready-to-hand as part of the action of fishing. To make tools useful to a specific context, a new tool needs to become present-at-hand to workers and used within workers’ background to create new understanding (ready-to-hand) and new designs (Ehn, 1988). Once a present-at-hand tool is assimilated into a practice, it disappears from the conscious mind, becoming a ready-to-hand tool or extension of a worker’s practice.

3.2.4 Tool concepts in OD

Tools in OD can also be seen as **objects for OD** or **tools for real participation**, where the participation rules of the design process are not controlled by designers, but a **real participation** in design is DIY. Participants agree on their own design rules with such tools (Lee, 2008) rather than being fixed by hierarchical position (Deleuze and Guattari, 1988). This situation challenges the notion of the designer as a person who understands what the best creative process and methods used to understand users are, transferring the design activity and understanding aspects to users with an appropriate toolkit (Von Hippel, 2001).

Tools in OD enable people to conduct improvement processes composed of a cycle of trial-and-error approaches (3.1.2) using the skills they already have, and the design language used in their tradition of practice (design as everyday activity as discussed in Section 2.1). Toolkits offer a design space that frames the challenge within an area in which people have expertise and experience to devise desired outcomes to improve their current situation with regard to products and services. For example, mountain-bike cyclists, who know the challenge of off-road tracks, can design better solutions to deal with the problems they are facing when practising their activities if they have access to appropriate toolkits to innovate in their practice.

Toolkits are composed of standard tools and modules of a defined solution space, enabling users to focus on specific aspects of a design. Taking the example of the mountain-bike cyclists, their toolkits would be composed of a hex key set, bike pedals, straps, and tires with different tread patterns, and other elements necessary for them to engage in the design cycle of trial-and-error. In another example that shows tools and modules, Nikolaus and Piller (2004) used a watch toolkit that allowed design activities in an online setting with a solution space of at least 650 million possibilities due to a broad module library of straps, cases, faces, hands to customise watches. Similar web-based customisation toolkits are used for trainers (e.g. Nike), personal computers (e.g. Dell), and kitchens (e.g. Ikea), enabling people to tailor their products according to their preferences.

Tool concepts in open innovation and design is a recent topic that was brought up by Eric von Hippel's influential paper in 2001. His initial concepts are still valid and provided a shift in design and innovation to users via toolkits (Von Hippel and Katz, 2002), calling for a change in designers' roles and practice. In summary, tools for participation in OD enable people to improve their own situations by designing practical solutions within their expertise in their own design practice. Guidelines for designing toolkits are outlined in Section 3.3.3.

3.2.5 Tool concepts in contemporary design practices

The previous sections explored tools used in the design of objects for use before use, where tools were seen as mediation artefacts between designers and users in order to design objects that respond to a problem or matter of concern. This Section will look at the **meta-design** or **design of objects for design after design** (Ehn, 2008; Björgevinnson *et al.*, 2012a) or **second order knowledge exchange design** (Cruickshank *et al.*, 2012), where prescribed methods and tools are criticised for not fitting the capabilities and understanding of participants in specific contexts.

The design of objects for design, such as tools, has been criticised as stakeholders and potential users will appropriate designed artefacts in unpredictable ways, which require more flexibility in use (Ehn, 2008). Furthermore, designerly tools and methods used for mediating conversations between designers and users within design processes have been criticised for not making sense to all participants, providing participants and designers little

space to be creative and express their ideas in a rigid solution space (Björgvinsson *et al.*, 2012a; Cruickshank *et al.*, 2012). These critiques led to a shift in designing tools and resources that aim at specific objects of design and identifiable users, to designing tools and resources together with people to support future designs and use.

This new design approach is known in the literature as infrastructuring design (Björgvinsson *et al.*, 2012a) or second order KE design (Cruickshank *et al.*, 2012), and involves entangled and intertwined design activities of planning, mediating, and enacting in workshop-like events. Both approaches focus on engaging different stakeholders, attempting to empower people with tools that can be appropriated and used in participatory design and co-design activities, which are part of designers as well as non-designers everyday practice, such as social services (Cruickshank *et al.*, 2017). Such tools support anyone interested in doing more engaging and practical consultation through design activities similar to OD tools used in manufacturing as shown in the previous section. For example, Leapfrog tools¹² and The Nesta DIY toolkit¹³ (NESTA, 2014).

In this new approach, tools are theorised as boundary objects that can support multiple design languages and understanding at project time as well as future use, where designers have to acknowledge that their tools will go on use again in another project, and eventually by new stakeholders. Although tools support multiple languages, they have to be tailored to particular contexts and needs, like in Scandinavian PD, where tools that simulate graphic settings were used to develop technologies for the newspaper industry.

This approach links together the trends, patterns and future directions identified in Section 2.3: The pattern of design practices (2.3.1), the trend of tools (2.3.2), and the research directions in the design of improved tools that can support the use before use (2.3.3) as well as design after design strategies. This review on tools used in design practices narrows down the type of tools that are considered ideal for the contemporary practice of design — where everyday activities are understood as a design activity (2.1) and tools support practitioners in conducting day-to-day design processes — making a new tool design approach the area of knowledge, to which this thesis seeks to contribute. This understanding of tool design leads to the exploration of theories involved in designing good tools in the following section.

Building on the notion of turns in tool design, the following section (3.3) will look at tool design principles and guidelines on how to make better tools for use before use as a way to find mechanisms to improve tools to support the design activities involved in new tool design practice. These design activities are further explored in the following chapter, which reviews the practices, roles and activities that are supported by tools.

3.2.6 Summary

This section explored the understanding of tools in different traditions, contextualising them in the current design stances and concepts in which they are applied. Section 3.2.1 contextualised the tools within the context of the design shift (2.2.1) and in improvement approaches (3.1.2) putting design and improvement on the same page. The review looked at Ivan Illich as a starting point to understand the definition of tools within the actual context of design, where **tools should enhance skills, giving people control and enabling them to constructively and creatively apply tools in their own practice of everyday design, with**

¹² www.leapfrog.tools

¹³ www.nesta.org.uk/toolkit/diy-toolkit/

understanding, in contrast to machines that control people to perform automatic actions. Finally, Section 3.2.5 discusses the design turn in tool design, setting the scene for Sections 3.3 and 3.4.

In HCD tools, design researchers employ tools to consult users about their expertise to assist them to design artefacts that solve specific problems. These tools are often a set of cards or handbooks with a set of rigid methods that designers have to follow to collect the expertise from users – who provide information that is expressed through saying, doing, and making – in order to design artefacts or objects of design. The majority of HCD tools leave little creative space for designers to create processes as well as for users to contribute with rich information. These types of tools can be understood as **tools for consultation**.

In Scandinavian PD tools, design researchers provide tools to workers to enable them to participate in the design process, ensuring that their **skills** are considered in the implementation of new technologies. Tools in PD are based on traditional craft or pre-industrial professionals, where people enhance their skills to design artefacts and services, i.e., objects of design. PD tools use a language and elements that remind people of their work, enabling them to express their practical knowledge in an area of expertise by designing and making designs, providing insights into their processes to design researchers. PD tools give people voice, but not do not give control of the design process, which remains with design researchers. These types of tools can be understood as **tools for participation** that includes people in designerly processes.

In OD tools, experts in a specific field create better solutions to deal with challenges they face in their everyday design activities using appropriate toolkits. These toolkits offer a solution space within the area of expertise people expect to devise better outcomes in their practice. Toolkits have a user-friendly design, requiring a **design language and skills users already have**, putting them in a process they are familiar with. Experts learn about the solution space by engaging in design processes, using tools to express their tacit knowledge to achieve a desired outcome, where a designer may or may not be part of the process. OD tools offer conviviality or real design participation to people, extending their skills, enabling them to creatively apply the tools in their design activities and control the process. These tools can be understood as **tools for real design participation** used for engaging with others in negotiated design processes.

As discussed in 3.2.1 and 3.2.5, tools in HCD, Scandinavian PD, and OD are seen as mediation artefacts that respond to a specific matter of concern as a design strategy focused on involving identifiable users in the design process. However, envisioning use is not the same as actual use, as people will appropriate tools in unforeseen ways in practice. This critique led to the emergence of new challenges in participatory design, where tools are seen as a public object for design that will be appropriated in different projects, eventually by new stakeholders. Regardless of the type of tool used in design processes, the challenge of making better tools for use before use and future use also includes tools used in DT/HCD (Björgvinsson *et al.*, 2012a).

To support this new tool design practice, this research looks at ways to improve tools for use before use to support specific needs as well as for design after design strategy to support future use and appropriation. To understand how to make better tools to support both strategies, the following section reviews the guidelines and principles used for designing mediation artefacts as tools in HCD, Scandinavian PD and OD.

3.3 Tool design: guidelines and principles

This section reviews design guidelines and principles within HCD, PD, and OD practices involved in the design of tools in order to understand how to improve tools for use before use as well as design after design. Considering computer systems as digital tools not machines (3.2.1), this section will explore theories involved in designing digital tools as sources of inspiration to understand how tools can be improved. The following subsections will explore theories involved in creating good tools within HCD, PD and OD practices.

3.3.1 HCD guidelines and principles for designing tools

This section draws on the HCD guidelines and principles in the design of computer systems, expanding initial discussions highlighted in Section 2.2.5. It will look at principles and guidelines to the design computer systems proposed by Kristina Hooper and Donald Norman (1986) and how they relate to the design of better tools.

Guidelines in architecture for designing digital tools: an analogy

Kristina Hooper (1986) draws her guidelines on commonalities between architecture design and interface design, looking at aspects that are considered when designing interfaces of environments or computer systems. This thesis outlines three of her guidelines that seem common to the design of KE tools: **Functionality, Interface as facade, and Flexibility**. These aspects will be discussed in the following paragraphs, drawing a parallel between architecture design, interface design, and tool design.

1. **Functionality:** The function is the primary consideration in the design of computer systems, buildings and tools as mediation artefacts. The function of a design is to fulfil the purpose for which it was intended, i.e., a design that works. In the architecture domain, the specification is articulated with a design program, i.e., design briefing. The architectural briefing specifies goals such as footage, adjacencies, circulation patterns and materials. In design, the briefing formalises mutual and coherent understanding of objectives, drivers, and issues (Murphy and Hands, 2012). In tool design, the briefing describes the frame, in which a tool can address particular challenges. For example, tools for engaging with people with aphasia would be framed to deal with the challenge of engaging with people who have difficulty with spoken and written language, presenting non-verbal elements that would enable them to participate in, for example, the design process of computer-based therapy tools (Wilson *et al.*, 2015).

Once a design briefing is satisfied, other attributes contribute to make the design work. The basic function of a building is to work effectively as a shelter, beyond this level the criteria for functionality depends on a relationship between designers and people involved in the project, and the social context in which it is designed. This relationship and context will define the form of the design, as different forms may represent the same functionality. The final form depends on the needs of the users of the tool, interface or building. For instance, the form of a KE tool used for engaging with young people should be full of colours, but the tool might not have the same form when engaging with young adults as they might feel that they are being treated as children.

2. **Interface as facade or entranceway?** Kristina Hooper makes an analogy between interfaces and two architectural elements that inform people about the use of a building or space: facade and entranceway. The facade is '*a membrane between the inside and the outside, and that its purpose is to articulate the relationship between the two. Others argue that a façade should contain information about the structure of the building, hence suggesting other viewpoints*' (Hooper, 1986, p.13). She argues that computer interfaces

are like facades, which people experience primarily and directly when they face interface designs. Therefore, interfaces have to be designed to attract users, considering how graphical and textual elements are carefully disposed on a two-dimensional screen in order to design a well-designed interface. Although false facades as jokes might be an issue, she concludes that *'no matter how beautiful a screen display is, an interface will not be effective unless the functionality of a system is revealed preferably directly'* (Hooper, 1986, p.13). Similarly, the entranceway as an interface is *'somewhat more informative than interface as facade'* (Hooper, 1986, p.14). She argues that entrances are traditionally and carefully designed to inform the whole place in a systematic way, like European cathedrals and formal Japanese gardens.

Theoretically speaking, the inside and the outside of an interface is the relationship between design concept and purpose called the interaction model in HCI. The concept of the interaction model is used to describe how an interface should work to enhance the use of interactive digital products and how a system is organised and operates (Johnson and Henderson, 2011; Preece *et al.*, 2011). In tool design, the interaction model is how the concept binds the intentions and context for which the tool was designed. For instance, the Microsoft PowerPoint reflects the conceptual model of users writing on a sheet of transparent plastic, then placing it on an overhead projector. Similarly, the Storyboard contract¹⁴, a tool for participation that is designed for collecting responses from young people, reflects the conceptual model of children drawing and using stickers to express their ideas about their needs.

- 3. Flexibility and adaptability:** In vernacular architecture, *'there has always been an emphasis on flexibility and adaptability'* (Hooper, 1986, p.14). Buildings are adapted to contain larger families, or they are changed to improve on the earlier effort. As discussed in Section 3.1.1 about improvement and adaptation, these vernacular buildings can be adapted to fit people better in the existing space or be improved to provide a better and long-lasting adaptability. In formal architecture, these concepts have not been typically the case as the changes in the design by non-designers would interfere with the coherence of the design (Hooper, 1986). As previously discussed in Section 3.2.5, the latter approach to architecture does not fit in the new tool practice of design as people appropriate buildings in unforeseen ways in the same way as they do with tools.

Kristina Hooper highlights that mechanisms for change are critical to flexibility and adaptability. She provides examples of local controls in architecture, such as windows and temperature systems to minimise weather effects on people's comfort, as well as interface design, such as double-click timing on operational systems to customise it to users' computing skills. She concludes that:

'flexibility in personalisation may not necessarily provide adaptable systems. One may want to rely on expert judgement of a best system as a first approximation, making changes available from this base level. One might to prevent the moving of walls, for example, but encourage the rearrangement of furniture' (Hooper, 1986, p.15)

In paper-based tools, this could be done by providing different layouts or editable headings in the digital file before they are printed out, or by providing blank spaces and enlarged tools to allow extra information.

¹⁴ Storyboard contract <http://leapfrog.tools/tool/storyboard/>

HCD principles

Human-centred design has roots in systems design, where computer systems – seen as convivial tools and also as mediating artefact – are easy to use, bring pleasure and provide control to users, enabling them to constructively and creatively apply tools in their practice (Norman and Draper, 1986). As previously discussed in Section 2.2.5, Donald Norman draws on Illich’s ideas of convivial tools to develop his initial principles, which he later developed into fundamental HCD principles for the design of everyday things, such as tools, that are usable and understandable based on cognitive aspects of design in his book *The Psychology of Everyday Things*, these main principles are (Norman, 1988, p.188):

- Make it easy to determine what actions are possible at any moment.
- Make things visible, including the conceptual model of the system, the alternative actions, and the results of actions.
- Make it easy to evaluate the current state of the system.
- Follow natural mappings between intentions and the required actions; between actions and the resulting effect; and between the information that is visible and the interpretation of the system state.

In this section, these principles are broken down in six fundamental psychological concepts that enable users to discover how a tool works, what it does, and what operations are possible. These are: affordances, signifiers, feedback, mappings, conceptual model, and constraints.

1. **Affordances** – This principle is described as ‘the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used. A chair affords (‘is for’) support and, therefore, affords sitting. A chair can also be carried’ (Norman, 1988, p.9). Norman (2013) reviewed this concept in the last version of his seminal book saying that affordances are not only properties, but a relationship between properties of tools as well as the abilities of the person who is interacting with it. In tool design, affordances can be designed to suggest the possible interactions, in which people make sense of them to understand how to use tools. For example, a paper-based tool can be designed with empty boxes to suggest that people can write words, ideas or draw something based on their abilities and understanding of the task and tool.
2. **Signifiers** – This principle involves communicating where the action should take place. Signifiers refer to ‘any mark or sound, any perceivable indicator that communicates appropriate behaviour to a person’ (Norman, 2013, p.14). They are signs that work as cues for people to understand the purpose, structure and operation of the tool. ‘Affordances determine what actions are possible. Signifiers communicate where the action should take place’ (Norman, 2013, p.14). In tool design, signifiers (e.g. signs, labels, drawings, arrows or diagrams) can be designed to instruct people what is needed to be done. For instance, paper-based tools should contain boxes with headings that communicate where and which kinds of information and action people have to perform to complete the tool.
3. **Mapping** – this principle involves describing a relationship between the elements of two sets of things. It is about the relationship of controls and their effect on the tool. In tool design, a good tool can be designed with specific colours, shapes, words that enable people to associate ideas, activities, or people. For example, a toolkit with three proformas used for supporting three engagement activities and one proforma used for evaluating these three activities, can be colour coded to facilitate the association of activities that need to be assessed.
4. **Feedback** – this principle involves the communication of the immediate results of actions. If the response of a computer system takes too long, people will give up using it.

This can be simple beeps, lights, sounds or touch sensors that show an action was received by users. In tool design, this principle represents the design of small details in the tool that supports people in completing specific tasks. For example, if workshop participants use a pencil to complete a tool printed on coated paper, they will notice that it will not work well. This feedback informs them of the need to use a Sharpie to fill in the tool instead.

5. **Conceptual model** – this principle involves describing a design to people in a useful way, presenting how a computer system works, supporting their understanding in how it will behave when employed in their tasks, providing them with a feeling of control during use. Norman explains a good conceptual or interaction model is a design that articulates the relationship between the users’ mental model (model formed through experience, training, instruction, and interaction) and the designer’s model (the conception of the look, feel, and operation of a tool). This idea relates to Hooper’s concept of ‘interface’ (1986) and the idea of design languages and skills (3.2.3). Following this principle in tool design, a tool should be designed to support a specific language and skills people already have or users’ mental models. For example, the building success tool¹⁵ reflects engagement practitioners designing the space and resources on a representation of a building they work together on, enabling people to predict the effect of their actions and understand how to use the tool within their own design language.
6. **Constraints** – this principle involves limiting the set of possible interactions guiding people to think in specific frames, as limitless possibilities might leave people confused. In tool design, this concept relates to the design solutions a tool or toolbox can support people to create in OD. For example, the Working with Young People¹⁶ toolbox is a collection of flexible tools that support practitioners to engage young people in listening, reflecting and creating desired outcomes in this design practice.

In summary, these HCD theories presented guidelines on how to design a good tool. Donald Norman and Kristina Hooper’s guidelines provided insights into the functions and the information details in the interface that are necessary for a good interaction with tools. Kristina’s guidelines look at designing interfaces that cover the use before use as well as design after design strategy from a macro to a micro perspective in terms of architectural and digital environments. Firstly, she looks at designing at the conceptual level: a design that works, a facade or entranceway that is primarily and directly experienced by people, and adaptable buildings. Secondly, she looks at the application level: the relationship of designer-user and the context, the disposition of graphical and textual elements, and the mechanisms for adaptability. Whereas Norman’s principles focus more on the details of designs and interactions, and on what tools can actually do, although he does not predetermine actions that people can perform.

3.3.2 PD principles for designing tools

As previously highlighted in Section 2.2.4, Scandinavian PD approaches aimed at giving workers better tools to improve their working conditions. This approach involved a pragmatic design theory that featured Wittgenstein philosophy, where a specific **design language** game that resembled workers’ practice was applied in the process through a **design-by-doing** approach, an experiential learning theory that draws on the work of many pragmatic philosophers (Lewin, 1946; Freire, 1970). In this way, workers could understand researchers and actively participate in the design and implementation of tools, where tools

¹⁵ Building success <http://leapfrog.tools/tool/building-our-neighbourhood-centre-together/>

¹⁶ Working with Young People <http://leapfrog.tools/toolbox/working-with-young-people/>

for prototyping acted as boundary objects to support design researchers and workers' communication. This understanding of participatory design still appears valid to improve practices, and therefore, this section will look at the principles of this practice (Greenbaum and Kensing, 2012, pp.34-35) in the following paragraphs.

Participatory design emerged as a way to give voice to workers in the implementation of technologies in industries to improve working practices and **equalise power relations** between management teams and workers. In community and public sector settings, these power relations involve giving voice to marginalised people, making sure their needs are considered in public decision-making. This principle is followed in parallel with **democratic practices**, where people interested in getting the benefits of the outcomes of a participatory design process act on their own interests as active agents of change. These practices happen through the involvement of those affected by a programme, policy or project in a mediated and collaborative learning process in order to achieve an agreed objective.

In these democratic practices, **situated-based actions** are taken at actual settings, where the people involved in the process look at their everyday design practice and exchange expertise among themselves in order to learn and improve their own practices. For example, in the Utopia project (2.2.4), design researchers had to learn about craft processes with graphic workers, and graphic workers had to learn technical possibilities and limitations with designers through a **mutual learning** process enabled by tools for prototyping and mock-ups to simulate craft processes (Ehn, 1988; Bødker *et al.*, 2000). Mutual learning involves working together with people to understand contexts, actions, skills, and technologies in actual settings (Greenbaum and Kensing, 2012; Van der Velden and Mörtberg, 2015) to achieve a desired outcome.

Outcomes of the mutual learning process can be **tools and techniques** (Greenbaum and Kensing, 2012), but also a **change in participants' mindset** that results in further collaboration in work and projects (Halskov and Hansen, 2015). Tools play a central role in creating a democratic space, supporting people to express their needs and desires within workshop-like events in order to develop **alternative visions about a technology**, such as tools for use before use and design after design.

Although most of these principles highlighted in bold are results of experiences and practices in Scandinavian PD projects that were politically motivated, they are still valid to develop practices and to design alternative visions about tools for use before use. However, more flexibility in tool use is required to enable future uses by others, as discussed in Section 3.2.5. The following section looks at the OD guidelines for designing tools for others to engage in design activities, transferring the creative process to people and enabling them to innovate in their own practices, looking at how tools are designed to provide flexibility in use.

3.3.3 OD principles for designing toolkits

Although the principles in this section have been already discussed in Section 3.2.4, this section outlines five principles to design a high-quality toolkit as follows (von Hippel, 2005):

1. **Learning by trial-and-error** – A toolkit should enable people to carry out a complete cycle of trial-and-error learning as they create their designs through testing and evaluating the effects of their decisions and improve on them. The SketchChair (Saul *et al.*, 2010), an application that allows people to build their own chair in a test environment, is a good example of a virtual environment as a toolkit for learning by designing and testing. The software allows people to draw a profile that is turned into a

design for a chair, which can be tested with a physical simulation of a virtual 2D human figure in order to check the ergonomics and stability of the designed chair.

2. **An appropriate solution space** – A toolkit should offer people a solution space that encompasses the designs they want to create. This solution space should be built into a specific manufacturer’s product system, such as a watch manufacturer.
3. **Commonly used modules** – A toolkit should contain libraries of commonly-used modules that users can apply to their designs, such as watch components for designing custom watches.
4. **A user-friendly toolkit** – An effective toolkit enables people to carry out design activities with skills they already have, using a design language that is already known or is familiar to them, which might require a little training to operate the toolkit. For example, watch enthusiasts might already know the components of a watch and how to assemble them.
5. **Result easily created by user** – Once the customised product is designed via toolkits, the final result should be producible using the equipment available by the manufacturer. As a toolkit is built onto a specific manufacturer, the manufacturer already has knowledge of their machine limitations.

Further research into toolkits was conducted by Cruickshank and Carolan (2011). Building on von Hippel’s principles, they designed a toolkit that enabled people to design smart homes composed of packaging design for the identification of components, worksheets to enable design cycles, a ‘Chocolate box’ map that identifies relevant components, and a booklet with guidelines and examples. This example of toolkit aimed at examining how users and households could design a smart house around their own experience and doing a different kind of data gathering that did not test the user but created something with real utility to participants. Their findings demonstrated the possibility of using toolkits without transforming the approach into a controlled type of engagement such as HCD and PD. This previous research led them into the contemporary practice of knowledge exchange design, where toolkits are designed to enable people to design their own workshop-like events or infrastructures (Björgvinsson *et al.*, 2012a). For these types of toolkits, they outlined the following guidelines (Cruickshank *et al.*, 2012):

- Provide ‘fuzzy’ tools which provide immediate basic functionality, but which reward modification and specialisation
- Include a useable prescribed (exemplar) knowledge exchange process to allow toolkit users to try it out
- Encourage departures from prescribed structures and implementations by providing the rationale for design decisions
- Require different degrees of departure from the prescribed structure at different stages to engender experimentation

Following on this research direction, where tools enable anyone to design in workshop-like events, this thesis builds on those tools that enable people to learn through trial-and-error, providing a basic functionality, exemplar processes and appropriate solution space for trying out and creating new approaches to creatively engage in co-design.

3.3.4 Summary and discussion

Having discussed how tools are used and developed in different design traditions, the following tool concepts are brought forward to respond the research question: **How can knowledge exchange tools be improved?**

Building on this review, the HCD principles for designing tools focus on three identified main dimensions: **Functions**, **Instructions** (information/interface), and **Flexibility**. While the first

two are about what the tool can do now and are focused on the designers' intentions and expertise, the third one is about what a tool could do, which emphasises flexibility and adaptability of design by users. Although instruction and functionality play a role in tool use, tool users are the ones who have the control in giving meaning to a tool according to the context, intentions and the community they are involved with.

The PD principles for designing tools focus on a pragmatic theory on how to make better tools. This pragmatic approach involves designing tools with those who have a right to take decisions on how best do their activities through designing and learning together by looking at their own everyday processes in order to envision improved tools that develop their design practice.

The OD principles for designing tools follow similar guidelines used in PD. However, the process of designing products, such as tools, are transferred to those who best know how to develop their practice through the use of toolkits. These toolkits enable experts in their day-to-day design activities to design, take decisions and learn about the effects of their decisions and improve their designs in their own domain of expertise, using their everyday design language without a need for mediation by professional designers. This toolkit approach was further developed for use in research, leading to the development of flexible tools for knowledge exchange design practices. Toolkits in this case could be the materials to gather data in engagement practices.

These tool design principles and guidelines of HCD, PD and OD underpin this research project seeking to redesign tools used in workshop-like events by involving engagement practitioners in collaborative processes of improvement. The following chapter explores the roles and activities involved in knowledge exchange design and brings together practices and theories in a framework that is used to answer the research question of this thesis.

3.4 Chapter summary

This chapter aimed at examining existing theories and concepts involved in designing better tools to develop knowledge exchange design practices. This was achieved by reviewing the concepts of improvement and tools within the design context, and theories used in the design of appropriate tools for design.

Section 3.1 reviewed improvement within the context of design, defining the term improvement as a deliberate spiral process of identifying issues, designing ideas to improve identified issues, and fact-finding agreement in satisfactory results and understanding of those involved in the situation being improved. This section also distinguishes improvement as a deliberative action that proposes lasting changes to a framework and adaptation as a non-deliberative action that looks to fit designs to an existent framework, where both concepts can lead to innovation, i.e., 'a new or improved product or process'. In this thesis, the situation in which improvement is sought involves tools used for designing workshop-like events.

Section 3.2 reviewed tools within the context of design, defining the term tool as a mediation artefact that enhances people's skills, giving them control to constructively and creatively apply it in their own practice of everyday design with understanding, in contrast to machines that control people to perform automatic actions. This section also looked at how tools are seen in HCD, PD and OD traditions, defining them respectively as tools for consultation, for participation, and for real participation. These terms are associated with

the ladder of participation concepts (Arnstein, 1969; Lee, 2008), where consultation represents the tokenism concept, and the participation is associated with citizen control. To move further up the rungs of this ladder, more flexibility in tool use is required. One approach to enable more flexibility in use is known as infrastructuring or second order KE design, where tools are designed to enable use in a current workshop-like event as well as future appropriation and application of tools in unforeseen ways.

Section 3.3 reviewed tool design guidelines and principles in HCD, PD and OD, looking at ways to design better tools to support the use before use as well as future use in workshop-like events. In HCD, architecture and cognitive psychology principles in the design of mediating artefacts (tools) led to the identification of the dimension of tools (**Functions, Instructions, and Flexibility**), providing insights into the design of good interaction with tools in a conceptual level (interaction models and interfaces), and an application level (aspects involved in the designer-user relationship). In PD, pragmatic design theory to design tools that improve working conditions provided guidelines on how to develop tools in practice, which can be summarised in six principles: **Equalising power relations, Democratic practices, Situation-based actions, Mutual learning, Tools and techniques, Alternative visions about technology**. In OD, principles of tools for transferring the design activity to users provided a direction to new co-design process, setting the scene for creative engagement approaches for exchanging knowledge in workshop-like events previously discussed in Section 2.2.7 and 3.2.5.

Following on this research direction, where tools enable anyone to design in workshop-like events, this thesis builds on such tools that enable people to learn through trial-and-error, providing a basic functionality, exemplar processes and appropriate solution space for trying out and developing new approaches to creatively engage in knowledge exchange design. As identified in Section 2.3.1, the practice of design within workshop-like events involves setting the stage for KE activities, enabling conversations between participants, and collaboration with those involved in the space. These knowledge exchange design practices are further explored in the following chapter.

4. Building a framework for improving tools for knowledge exchange (KE): Bringing tool design practice and theory together

Chapter 2 and 3 sought to provide an overview of how design, improvement and tools have been conceptualised and approached so far in theory and practice within the landscape of design traditions that emerged since the 1960s until present days. This chapter builds on the patterns of design practice in planning, enabling and the actual doing activities in workshop-like events (Chapter 2), and the theory of designing tools to support and improve the practice of co-design and PD (Chapter 3). This chapter will look more in-depth into the roles and activities involved in infrastructuring / KE design to build a practice landscape that helps to understand how the dimensions of tools (Functionality, Instruction, Flexibility) are related to this new practice. This chapter concludes with a theoretical framework to improve tools used for orienting this research that seeks to answer the research question: **How can knowledge exchange tools be improved?**

To explore the approaches involved in infrastructuring and KE design, this section will consider the PD concept of method (Bratteteig *et al.*, 2013) to review how practice is understood in this thesis. Method is a 'coherent set of organising principles and general guidelines for how to carry out a process from start to finish', where methods cannot be applied as a 'recipe' in practice, but can provide guidelines that support practitioners to select, adapt or create their own techniques and approaches to specific situations. In this sense, there are PD methods generalised from empirical experiences conducted by professionals as well as OD methods that are not documented in design literature but are disseminated in complex networks, such as city council networks or virtual communities.

The application of such methods in day-to-day practice becomes part of a mastering process of acquiring personal design skills and expertise in carrying out a design process, which is not exactly the same as prescribed in the original methods and is supported by techniques and tools. These specific processes, techniques and tools establish a way of working and engaging with others that characterises a tradition of practice. This learning process and development of practices are well described by Donald Schön, Brian Lawson and Kees Dorst as previously discussed in Section 2.1. In this context, where everyone is a designer within their own tradition of practice, tools are designed and assigned to support practitioners' skills and expertise in conducting co-design and PD activities, techniques and processes, giving them autonomy to work in the way they are most comfortable.

In contemporary co-design and PD academic and grey literature, there are a large variety of tools and toolkits for multiple applications available to support such practices (e.g. Ketso toolkit, Oblique Strategies, Creative Whack Pack and IDEO method cards). However, there is little evidence on what works outside of professional design practice, and most of these tools are interpreted as a cookbook recipe to conduct collaborative activities, leaving little space for practitioners and participants of workshop-like events to apply tools with understanding, autonomy, and creativity. One approach to create tools that are appropriate for particular contexts, needs, and design skill and expertise is to improve existing tools and develop new versions of them. This approach requires an understanding of the activities and roles in the planning, facilitation and participation of those involved in a workshop-like event and how

theories of tool design can be applied to improve such activities and practices. These KE design practices are explored in the following section.

4.1 KE design practices

In co-design and participatory design approaches, knowledge is co-created between those involved in the design process, where improvements and skills are developed with organisations and communities involved in KE. Knowledge exchange reflects a broader concept that includes a wider range of methods, disciplines and forms of knowledge, and has been recognised as having the potential to widely impact society over the last twenty years (Davenport, 2018). In this thesis, the broad concept of KE design embraces these two contemporary design approaches conducted by designers and non-designers, as previously stated in Section 2.2.7.

Leon Cruickshank et al (2012) defines KE design as ‘a type of interaction design in which human to human interactions are designed’, which is a combination of a number of disciplines including interaction, design, graphic design, cognitive psychology and innovation studies, but it can also be referred to as an everyday co-design practice known as creative engagement (Cruickshank *et al.*, 2017). KE design practices are enabled and constrained by different roles that permeate engagement activities, such as designers, facilitators and participants, where tools are often used to support and enhance a creative exchange among those involved in order to achieve an agreed objective.

- **KE designers** - these roles are assigned to engagement practitioners who are experts in creating open design spaces, where the exchange of ideas and expertise between participants aims at the emergence of new designs and approaches (Ehn, 1988; Botero et al., 2010; Cruickshank et al., 2012; Zamenopoulos and Alexiou, 2018). They are practitioners whose main role is to **plan** a collaborative structure and design tools to support the engagement of participants in a design process in order to meet an agreed objective. The outcome of such practitioners is typically a workshop-like event or series of events, where their presence might not be necessary
- **Facilitators** are practitioners whose main role is to **enable** and enhance the engagement of participants in KE activities through techniques and actions that support the creative problem-solving abilities of a group of participants in order to meet an agreed objective. Their role is to lead design processes and guide participants with clear description of steps to be taken, aiming at designing desired outcomes for a specific situation. In these creative processes, they often use tools as resources to support and enhance the job of facilitating (Tassoul, 2009; Cruickshank and Evans, 2012; Cruickshank, 2014)
- **Experts** are practitioners who exert influence on or are affected by a project, programme, process or policy. They constitute a representative of a community or wider community, extended community of potential users, or beneficiaries of the outcomes of KE activities (Zamenopoulos and Alexiou, 2018). They mainly participate in KE activities through **doing** activities to share their expertise and understanding in engaging with people and tools within a community of practice, i.e., a group of people who share a common interest, a passion, a craft or a profession (Wenger, 1998).

Given the roles of KE design practice, the following sections will focus on the landscape of design activities in Chapter 2 (planning, enabling and the actual doing activities in workshop-like events) and how the dimensions of tools identified in Chapter 3 (Functionality, Instruction and Flexibility) play a role in supporting the design of tools in these overlapping design activities. In summary, each practice predicts different outcomes, where the design of tools assists in different layers of the KE design practice.

4.1.1 Planning KE activities

Planning KE activities to engage with experts with different backgrounds involves considering the aims and objectives, audience, and actions and techniques used for engaging with participants, where tools are often adopted to assist this practice. These elements compose a collaborative structure referred as a participatory workshop (Chambers, 2002), solution space (Tassoul, 2009), design space (Marttila and Botero, 2013), architecture-events (Björgvinsson *et al.*, 2012a) or KE design space (Cruickshank *et al.*, 2012). In this thesis, these spaces will be referred as OD spaces.

The planning of OD spaces for KE is not limited to professional designers. Non-designers, such as community organisers and student groups, have a long history of conducting such planning processes with communities since the 1960s (Davidoff, 1965). Similarly, communities of software developers, innovators and advanced users have engaged in exchanging knowledge within complex networks using their own tools, methods and practices (Botero *et al.*, 2010). This section explores how a tool and its dimensions are considered in planning OD spaces for exchange of knowledge in projects, where the functionality and instruction dimensions play a role at the present time (use before use), and the flexibility dimension allow appropriation of OD spaces in future projects.

Functionality

The role of designer of such spaces is to select and devise tools and mechanisms to enable participants to explore alternatives, creatively engage and communicate their expertise and develop their understanding of a future reality within a design process in order to achieve an agreed objective (Ehn, 1988; Cruickshank *et al.*, 2012; Zamenopoulos and Alexiou, 2018). This could be about increasing awareness, building a network, understanding social situations and individuals within them, etc. The design of this space for KE involves planning the human to human interactions and mediation artefacts (tools) as the interface of creative conversations between participants in the process.

With regard to this, Hopper's guidelines (1986) recommend that the function is the primary consideration in the design of a space as part of an **interaction model**. In KE tools, the interaction model binds the intentions and engagement context which a tool is designed for. In this context, individuals are involved in conversations assisted by a tool whose concept enables creative engagement. Each tool requires specific inputs from practitioners and participants in order to make it work. These inputs are the interactions people have to perform when they are engaged in solving the contextual challenges they have to face. The interaction model leads the way and gives direction for a creative engagement of communities, supporting the design process of engagement practitioners. The interaction model is how a tool and actions that are part of an engagement activity interrelate, in ways that support real-life interactions (i.e. practical use). For example, a tool designed to engage with children by collecting drawings as responses about their preferences enables practitioners to understand the children's voice and take decisions based on evidence. In this example, drawing responses is the interaction model of a tool that satisfies the intention of collecting YP's voice in the engagement process.

Instruction

The OD space is described as a territory for negotiation of the **briefing and challenge** for a project (Marttila and Botero, 2013), which is framed in a mutually engaging, dynamic participative process (Murphy and Hands, 2012) by those involved in the project that may or may not involve professional designers (Zamenopoulos and Alexiou, 2018). With regards to the design of spaces and tools, it relates to the architectural analogy used in Hopper's

guidelines (1986), in which elements (tools) that inform people about the use of a space are provided. In tool design, the briefing guides the concept of the tool, providing essential information about the design of a tool and describing the frame in which a tool can be used to address a specific engagement challenge. For example, engagement practitioners, who deal with young people (YP) issues on their everyday practice, have to include YP's voice in the decision-making processes and often employ and design tools to support their practice. This engagement challenge requires a tool that has a purpose of collecting YP's voice to support practitioners' skills and expertise.

Flexibility

Hopper (1986) argues that vernacular architectures have always been built with emphasis on flexibility to adapt individuals or to enable improvements to fit different needs. In HCI, Alan Dix (2007) discusses the design for appropriation, where designers can design to allow for the unexpected by, for instance, not making systems or products with a fixed meaning. For example, MacOS allows users to associate colours with files or folders, but there is no fixed meaning to each colour.

Designing KE tools, which allow appropriation, can lead to new tools that could become part of existing everyday design practices. This requires building **resilience** in tools to deal with unforeseen applications. To engage in this approach of design after design, tool designers need to follow the principles of PD outlined in Section 3.2, where they support the introduction of new technologies in creative engagement practices in public spaces (Björgevinsson *et al.*, 2012a; Cruickshank *et al.*, 2017).

For example, in a creative engagement project called Make it Stick (Cruickshank *et al.*, 2017), the researchers developed a tool to enable creative engagement without the need for participants to write, which was initially designed to be customised, downloaded and printed. However, they noticed that the tool was not meeting the needs of the people due to the limited customisation. As a result, they designed an interactive template that allowed users to customise the sticker template, enabling people to use it in unexpected ways, supporting a creative adaptation of the tool. The resilience can be provided by editable components built in a tool or other mechanisms for change, such as local controls as exemplified by Hooper (1986) in Section 3.3.1.

4.1.2 Enabling KE activities

Enabling KE activities involves implementing the plan within an OD space, where a facilitator uses methods and techniques to facilitate a creative exchange between participants. Their role is to make sure everyone can contribute to an activity in order to make the most out of the expertise and creativity of participants. Mark Tassoul defines the job of facilitation as 'setting the right conditions for a group of people to do a good session, highly inspired and a high quality of interactions and concept generation' (Tassoul, 2009, p.33). In this activity, a facilitator **formulates mechanisms and actions** that have specific functions (e.g. energising participants and generating ideas) to draw participants into design processes where tools are often adopted to assist this engagement practice known as creative facilitation (Tassoul, 2009).

There are two broad approaches in designing creative facilitation (Cruickshank, 2014). The first approach is based on planning processes and designing structures, where a facilitator designs session plans (time, number of people, circulation, etc) and activities that participants will follow through in a project. This involves planning the environment using an experiential approach, adopting elements of interaction design based on the perceptual

senses of sight, sound, smell, taste and touch (King, 1989; Saffer, 2010; Cruickshank *et al.*, 2012), and assigning tools and techniques that are available in the literature to assist in the facilitation of the activities of the session plan. The second approach is about providing a space to improvise that is inspired by theatre techniques to enable flexibility in the process of facilitating sessions, where tools are employed to assist the enactment process (Brandt *et al.*, 2012; Cruickshank, 2014).

These two approaches can be associated with the functionality and instructions of each KE activity within a facilitated design session before delivery, while flexibility is associated with improvising sessions within a planned structure at the time of project delivery. These similarities between KE planning process and designing a facilitation session are highlighted in an interview with Marc Tassoul (Cruickshank, 2014), in which he explains that they are not the same process. One is about planning an activity in a traditional way, and the other one is about designing a facilitation session as a type of conceptual prototype, where role-playing the planned ideas for activities and analysing the implications of these lead to a practical facilitation session. The following paragraphs explore further how a tool and its dimensions can be considered in designing creative facilitation approaches.

Functionality

When designing creative facilitation, facilitators identify priorities and expectations of stakeholders, which can be formalised in an agreed briefing with the commissioning organisation or a group of people affected by the project, similar to a typical design process as inputs for designing creative frameworks (Cruickshank and Evans, 2012). Once the facilitation approach is established, either through the design facilitation session or as part of everyday design process, facilitators assign or **produce resources** and tools to support the facilitation of activities.

The function of tools should fulfil the purposes of supporting the job facilitation and achieving the agreed objective of the session. These resources produced by facilitators include maps, exercises, and inspirational activities, and support them to engage with participants, guide their actions, and collect information needed for learning, evaluation, objectives in a planned session.

Instruction

Once the plan and materials are designed, **facilitator notes** are created to support the delivery of a facilitation session (Cruickshank and Evans, 2012). These notes describe to a facilitator how a tool should be introduced to participants, and include instructions about the space, times, duration, requirements, breakdowns, examples, rules, techniques, activities, etc. Facilitator notes are procedures and recommendations related to intuitive techniques (Tassoul, 2009). Mark Tassoul describes intuition as involving space, timing, listening, silence, working with art, letting go, letting space open. This kind of information can be provided in a tool guideline sheet, website or handbook to support facilitators in assisting and assigning tools in their practice.

Flexibility

Once the creative facilitation framework is designed to respond to an agreed briefing (the number of participants, event duration and timing, venue requirements, objectives) and facilitator resources and notes are created to support the exchange of knowledge between those involved in the session, the delivery of a facilitation session requires flexibility and adaptability of the plan. A facilitation session can be compared with the architectural analogy used by Hooper (1986), where sessions are adapted to better fit people in a

designed space. In architecture, the use of local controls can minimise effects on people's comfort. Similarly, the allocation of time or plan contingency can minimise the effects of unscheduled events in creative facilitation, encouraging **facilitators to respond** and adapt to the schedule, focus and potential outcomes of the event.

4.1.3 Doing KE activities

Engaging with others in KE design requires participants to exchange their expertise and ideas through engagement activities. Tools invite participants to engage in creative conversations through doing, writing, or making things to participate in projects, policies, processes and programmes that affect their lives (Zamenopoulos and Alexiou, 2018). This participation practice with tools involves people in making, telling and enacting activities or a combination of these three categories to creatively exchange knowledge between participants of the activity (Brandt *et al.*, 2012).

In telling activities, the use of visual materials assists participants in telling about their experiences, building up their everyday setting or illustrating their flow of activities. Tools support people to tell a story about their practice. For instance, in early stages of the Scandinavian participatory design, a large Danish software company wanted to build a system to control waste incinerator plants (Bodker *et al.*, 1992). When designers asked a worker how the system worked, the operator used the incineration machine to tell designers about their working process, highlighting elements that did not fit the situations for which they were intended. This story represents how a mediation artefact can be used to elicit people's embodied knowledge, if used in the everyday context. In a more contextual example in co-design, a tool called engagement map key helped NHS staff from different levels of hierarchy to draw out their process of translating evidence, using symbols and developing their own symbols to visualise the organisation's engagement process (Whitham *et al.*, 2019).

In making activities, tools give people the ability to create things to externalise ideas and embodied knowledge in the form of artefacts, helping them to visualise what a design could be. For example, tools for prototyping explored in the Utopia project assisted graphic workers to simulate their working process, facilitating workers and designers to visualise what the new computer system could be. In a more contextual example in co-design, a tool called target control assisted a six-year-old child to create a visualisation that communicates which of the family members were close and distant from him/her, using a template and stickers with shape of humans, hearts, and thought balloons (Whitham *et al.*, 2019).

In enacting activities, tools can support people to imagine and act out possible futures by experiencing a design setting and exploring activities that are likely to take place. In the co-design project Beyond the Castle (Cruickshank *et al.*, 2013), two of the eight interconnected activities that took place in a green space behind Lancaster castle can be seen as enacting examples. Through enacting the past into present, a living Roman centurion and a swamp fairy were designed as tools to elicit deeper interaction, supporting the community to co-design improvements to the public space.

Designing tools as mediation artefacts to engage participants has been already discussed in Section 3.3. To enable people to say, do and enact KE activities, a tool needs to communicate how it operates, instruct participants on how to interact and provide adaptability to fit it into different design practices. The following paragraphs frame the previously discussed tool guidelines into the engagement of participants in KE activities, looking at how functionality, instruction and flexibility play a role in this process.

Functionality

As previously discussed in Section 3.3.1, once a tool meets the briefing requirements and works effectively to address an engagement challenge, the form of the design will depend on the relationship between designers, facilitators and participants involved in the social context in which a tool is designed. In this respect, it is related to the **design of material**: the appearance and features of a tool. It is how participants perceive the possible actions (affordances) and the cues to understand the operation of the tool as signifiers, where the action should take place.

These signifiers are interactive elements present in the printed material or digital interface, such as diagrams, text boxes, format, the thickness of the paper, and other visual elements and attributes that contribute to make a tool work in practice. If the design of material does not 'speak' the visual language of participants, a tool will prove unlikely to work in a specific context. A good **design of material** communicates the purpose, structure, and operation of the tool to the people who use it. For example, consider a tool used for collecting young people's voice as a colourful and fun medium to play with, if the same tool is used in a young adult context, the tool might not work in practice, as they might feel they are being treated as children.

Instructions

As previously discussed, Hooper (1986) compares computer interfaces to a facade or entranceway in architecture that contains information about the structure of a building; it is the introduction to a building. In computer systems, tracings, bits and pieces constitute a general understanding of a system. She argues that a good design carefully considers how graphical and textual elements relate to a two-dimensional screen (also associated with mapping in Norman's concept) in order to provide an approachable interface. In tool design, these textual elements refer to **wording** that presents and introduces a tool and suggests its uses. They are **example or use notes** that instruct participants, providing inspiration on how to fill in the blank spaces of a tool. For example, the word 'visit' in a tool for engaging with young people looks more informal and approachable for participants than 'meeting'.

Flexibility

As previously shown in Section 3.3.1, Hooper (1986, p.15) differentiates that 'flexibility in personalisation may not necessarily provide adaptable systems'. While the first is covered in the planning KE activities (4.1.1), looking at the appropriation of tools, the second is covered by enabling participants to do **contrary activities** in action. This refers to the non-deliberative action of adaptability, as discussed in Section 3.1.1., where participants fit existing tools into their creative practice in KE activities. For example, a tool could be designed with blank text boxes instead of lines. In this way, participants would not feel restricted to complete all the lines, enabling them to draw if they wish so.

Having reviewed how functionality, instructions and flexibility played a role within KE design practices, the following section will build on this review and develop a theoretical framework that seeks to answer the research question: **How can knowledge exchange tools be improved?**

4.2 Improving dimensions of tools within KE practices: a theoretical framework

The emergent challenge of KE design (field of study) is to create tools to support multiple design languages and understandings within KE activities (4.1), enabling people to creatively

apply tools at a project time and to appropriate them for use in future projects (3.2.5). As a response to this challenge and the research directions identified in Section 2.3.3, this thesis builds on the previous section, mapping the overlapping KE design practices and dimensions into a framework, called Improvement Matrix (Table 2), used for orienting this research into improvement of tools. **This research study attempts to determine whether and how each layer of KE practice could improve tools using the major propositions: Functionality, Instruction, and Flexibility that are guided by the framework below.**

Table 2. Building the Improvement matrix

Dimensions Layers	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
DESIGN (Planning KE) Section 4.2.1	Design + Functionality	Design + Instruction	Design + Flexibility
FACILITATION (Enabling KE) Section 4.2.2	Facilitation + Functionality	Facilitation + Instruction	Facilitation + Flexibility
APPLICATION (Doing KE) Section 4.2.3	Application + Functionality	Application + Instruction	Application + Flexibility

As seen in the previous section, the use dimensions of tools (Functionality, Instruction and Flexibility) within the landscape of KE practice stimulates seeing tools in new ways, shaping the initial design of this research. The following sections summarise the content of the improvement matrix and look at **how the practice of improving tools using the three design propositions predicts positive changes (3.1.2) in each KE practice and activities.**

4.2.1 Design

The improvement matrix suggests three components that support the design layer of engagement formed by the intersection of the design layer with tool dimensions as shown below.

Table 3. Design layer of practice

Dimensions Layer	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
DESIGN	Interaction models	Challenge / Briefing	(Build) Resilience

1. **Interaction models:** Designers critique the conceptual model of how a tool addresses a contextual engagement challenge, and then they suggest improvements to how the concept could enable better creative exchange among individuals. For example, a tool that requires the use of blank sticky notes can be improved by using customised stickers for a particular task, so participants can focus on a specific context through redesigning the interaction of the activity.
2. **Challenge / Briefing:** Designers look at the briefing that describes the frame, in which a tool addresses a particular engagement challenge, and then they suggest improvements to the manner the tool is introduced to engagement practitioners when planning KE activities. An improved briefing changes the way a tool can solve a problem, making the problem-solving more effective. Designers focus on wording, examples and notes provided on a website or instruction sheet, and suggest changes

to the way a tool is described to solve contextual challenges, assisting practitioners to address these challenges. For example, a description of a tool use can be enriched with more stories of use, so it can improve ways that practitioners can use a tool when thinking about the challenge / briefing they have to solve. Improving the instructions for the challenge supports engagement practitioners towards effectively designing an activity around a tool.

3. **(Build) Resilience:** Designers look at how a tool accommodates unforeseen applications, and suggest improvements on the design concept to make it flexible to multiple contexts, such as editable components, as exemplified in the Make It Stick project (Cruickshank *et al.*, 2017)

The improvement of tools in this layer of practice will develop the KE practice of planning open design spaces (4.1.1), providing engagement practitioners with new ideas to address their challenges at current and future engagement projects.

4.2.2 Facilitation

The second layer formed by facilitation layer and tool dimensions, suggests three components that support a creative facilitation practice with tools as shown below

Table 4. Facilitation layer of practice

Dimensions Layer	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
FACILITATION	Resources produced by facilitators	Facilitator notes	(Encourage) Facilitator response

4. **Resources produced by facilitators:** Facilitators critique the resources such as tools produced to give support to planned sessions, and suggest improvements on how to better use resources to guide participants to achieve an agreed objective. For example, a tool that supports a facilitation approach to gather collective ideas from a group of entrepreneurs can be improved to work with local residents by giving specific actions to promote better creativity and problem-solving skills that fit their expertise.
5. **Facilitator notes:** Facilitators critique the guidelines on how they can use a tool to support their facilitation session, and suggest improvements to the instruction provided for facilitators, making a tool more appropriate to be facilitated in the engagement activity. For example, a tool that instructs facilitators on how to draw out ideas from their participants can be improved to provide more appropriate guidelines for a particular context or by adding extra information for facilitators.
6. **(Encourage) Facilitator response:** Facilitators look at the different ways a tool can be used to enable innovative dialogues, and then suggest improvements on the ways a tool could encourage creativity and problem-solve abilities of facilitators in multiple situations. Thus a facilitator could change and improvise their way of mediating a facilitation session instead of sticking to an initial plan in unforeseen situations. To improve the **facilitator response**, practitioners can provide different strategies and tips to engage with participants, focusing on various situations where the tool might

not work in the way it is expected, and providing ways to change the facilitation approach. A responsive facilitation is not about what a facilitator has to do to follow the plan, but what facilitation options are available for them to achieve the objective of an engagement activity. A way to improve facilitator response can be achieved by providing different ways to facilitate an engagement activity around a tool. Describing experiences and stories about facilitation strategies using a tool can enhance facilitators' response and flexibility, and therefore, their ability to improvise. For example, suggesting participants use the blank spaces of the tool for an improvised activity can be a way to change the tool to support this practice. In another example, a tool can be improved by providing examples of uses and tips to engage participants, focusing on different situations where the tool might not work in the way it is expected, providing ways to change the facilitation approach and afford flexibility to new facilitators.

The improvement of tools in this layer of practice will develop the KE practice of enabling people to creatively exchange ideas and inputs in design processes (4.1.2), providing facilitators ways to assist participants' understanding and their contribution to engagement projects with their expertise.

4.2.3 Application

The third layer of the matrix is the **application** layer. The improvement matrix suggests three components that support the practical use of a tool by participants, which are described below:

Table 5. Application layer of practice

Dimensions Layer	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
APPLICATION	Design of material	Example or use notes	(Enable) Contrary activity

7. **Design of material:** Experts critique the visual elements of the tool (features, appearance, format and images) and suggest improvements on how the graphic design is presented to participants of a KE activity. For example, an A6-sized tool designed to gather ideas can be improved in a bigger format to support more detailed ideas or extra notes in a lengthy activity.
8. **Example or use notes:** Experts critique how the use notes instruct participants on how to complete a tool, and then they suggest improvements to the wording presented in the tool. For example, a tool title that includes the word 'meeting' can be improved to be used in a more informal context and changed to 'get-together'.
9. **(Enable) Contrary activity:** Experts look at how a tool enables unexpected uses by participants, and then they suggest improvements on how the tool could support different responses. For example, a tool with blank lines where someone should write something could be improved to enable other forms of expression by changing the blank lines for blank boxes.

The improvement of tools in this layer of practice will develop and improve the practice of doing knowledge exchange through writing, making, and enacting activities in engagement projects (4.1.3) by developing tools that are user-friendly to the individuals (3.2.6.) involved in an engagement project.

Building on these nine elements, the following chapter looks at the research methodology for testing the Improvement matrix as the design proposition for improving tools presented below:

Table 6 - The improvement matrix

Layers \ Dimensions	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
DESIGN (Planning KE)	Interaction models	Challenge / Briefing	(Build) Resilience
FACILITATION (Enabling KE)	Resources produced by facilitators	Facilitator notes	(Encourage) Facilitator response
APPLICATION (Doing KE)	Design of material	Example or use notes	(Enable) Contrary activity

4.3 Conclusions to the theoretical framework

This chapter presented a theoretical framework that brought together the practices explored in Chapter 2 and concepts involved in the design and improvement of tools in Chapter 3. The improvement framework is composed of a landscape of knowledge exchange practices that involves planning OD spaces, enabling participants to creatively exchange knowledge to achieve an agreed objective, and sharing expertise through doing activities to participate in projects, policies, processes and programmes that affect the lives of those involved in the knowledge exchange activity. The following chapter reviews how this framework can be tested in practice, describing the methodological approach used for answering the research question and reviewing methods that can be used to explore the Improvement matrix.

5. Research methodology

This chapter discusses and describes the research methodology adopted for this enquiry that aims at developing a framework for improving tools for knowledge exchange. It provides details on the research approach and methodology (5.1, 5.2), a review of research methods (5.3) used in the research design (5.4), the research strategies and techniques used for data collection, analysis, and sharing conclusions (5.5) that were selected to achieve the research aim, providing a rationale for this PhD study. This chapter concludes with a summary of the methodology, presenting the overview on how this PhD research was conducted to respond to the research question **How can knowledge exchange tools be improved?**

Research methods, strategy, methodology design, forms of enquiry are often used interchangeably to refer to the same approach without clarity (Helena *et al.*, 2017). This section will follow the terminology defined in Section 3.2, where methods are a set of principles and guidelines on how to conduct research, techniques are ways to conduct research phases (gathering and analysing evidence and communicating results), and in addition to the terminology, strategy as a set of techniques performed to achieve the overall goal in each research phase.

5.1 Research approach

Bruce Archer defines research as '*a systematic enquiry whose goal is communicable knowledge*' (Archer, 1995, p.6). Archer's definition is included in Bayazit's (2004, p.16) definition of design research as she describes it as a 'systematic search and acquisition of knowledge related to design and design activity'. Nigan Bayazit also states that design research supports the investigation of the artificial made by human beings and is 'concerned with construction as a human activity, how design works, how they think, and how they carry out design activity'. Although Bayazit (2004) highlights design research as a construction of human activity (in which this thesis is concerned), her definition is intrinsically linked with the development of technology at the end of the process. This kind of design research, where the knowledge of the design process is tied to formalizable, and teachable doctrine based on science, technology and rationalism (Simon, 1996), is not the focus of this thesis.

With design research in the Humanities tradition, humankind is the central concern where the activities are subjective and often based on empirical evidence in the real world, in contrast with the Sciences tradition, where the physical world is the central concern (Archer, 1995). In this kind of research, design knowledge resides in people and in their natural ability to design, where the subject of investigation is how people design (Cross, 1999). It relates to understanding how people learn, study, or develop design activities, such as the designerly ways of knowing conducted design researchers like Bryan Lawson, Kees Dorst, and Nigel Cross. The practice of Art and Design is another category, where actions are planned to generate and validate new knowledge and understanding (Frayling, 1994). That is, design knowledge resides in its process, which focuses on tactics and strategies of designing (Cross, 1999).

In this PhD enquiry, knowledge is tied to practice, where the **reflection in action** is how knowledge is generated. This epistemology of practice developed by Donald Schon in the 'Reflective Practitioner' (1983) sees that knowledge is generated '*in the skilful performances of expert practitioners*' instead of something discovered by researchers, made practical by

applied researchers, and then taught to practitioners (Coghlan and Brydon-Miller, 2014). In this doctoral research study, the practice-based research involves the investigation of the activity of improving tools through the action of co-design, in which the Research through Art and Design approach (Frayling, 1994) can be carried out alongside other research methods, such as case study, ethnography, grounded theory in order to develop a framework for improving knowledge exchange tools to develop a practice of design.

In research through design (RtD), the Research (with a capital 'R') is often used alongside the word 'development' and refers to 'work directed towards innovation, introduction, and improvement of products and processes' (Frayling, 1994, p.1). RtD focuses on generating new knowledge that is communicable, differing from research (with a small 'r'), where the end product is an artefact, in which the knowledge is embodied and not communicable in a verbal sense. In RtD, Sir Christopher Frayling (1994, p.5) states that:

'this kind of research, sometimes known as the degree by project – with a specific project declared in advance of registration – involves for the MPhil studio work and a research report, and for the PhD studio work plus a more extensive and substantial research report'

In regard to Frayling's statement, this PhD research project was initially registered as 'An approach for designing knowledge exchange mechanisms', where the researcher delivered workshops as part of the £1.2 million AHRC funded project Leapfrog (www.leapfrog.tools). Leapfrog aims to transform public consultation through the development of new approaches for the engagement of communities in public service decision making. These emerging approaches employ engagement tools that were co-designed in collaboration with public sector and community partners to support creativity and problem-solving abilities in non-designers without using designerly processes. These tools present suggestive and motivational instructions, and editable elements in order to support people in creating their own application of tools. To understand how to improve these tools, this research project uses the Leapfrog project as a testbed for testing the theoretical framework developed in Chapter 4, using the RtD approach to answer the research question: **how can knowledge exchange tools be improved?**

To explain RtD from the lens of traditional theses (Swann, 2002) or scientific research model (Volonte *et al.*, 2016), the research is carried through a design project, where the design proposition becomes the hypothesis that is tested. Koskinen *et al.* (2011) treat these hypotheses as design prototypes used for generating knowledge, known as physical hypotheses. They can be artefacts, spaces or techniques (e.g. alarm clocks, funky-design-space, or camera variations) that shape a theoretical design proposition that is set up to be tested and discussed. Similarly, Bang *et al.* (2012) define 'hypothesis' in RtD as qualitatively informed or questioned informed, in which *'knowledge, empirical findings, concepts and ideas are combined as a form of abstract prototypes to be tested debated according to their relevance to practice, academia, and practicability or feasibility of the experiment'* (2012, p.7). In this thesis, the improvement matrix described in Section 4.2 works as a design prototype used as a theoretical framework that attempts to answer the thesis research question.

In research through the medium of practitioner activity, the best way to shed light on a design proposition is to attempt to create something calculated to explore, embody or test it (Archer, 1995). In this PhD study, such activities are carried out by co-designing improvements of tools that are planned to provide further information on the Improvement

Matrix through the Action Research methodology. There are a range of methods that can examine this matter; these methods and action research methodology are outlined below.

5.2 Action Research (AR)

Action research is a form of collaborative enquiry that enables practitioners to investigate and evaluate their own practice in a reflective process. It is about improving practice through improving learning (McNiff and Whitehead, 2010). AR is an emergent process that 'seeks to create participative communities of enquiry in which qualities of engagement, curiosity and question posing are brought to bear on significant practical issues' (Reason and Bradbury, 2008, p.1). This research methodology can be seen as a combination of useful problem-solving and research in a real-life situation, e.g., social action and research whose goals are to generate knowledge and contribute to new practices.

AR involves investigating a question or hypothesis - a provisional hypothesis in the sense that it is open for further modification. The hypothesis is defined by Koshy (2005, p.39) as '*based on a tentative, speculative conjecture about an issue which you wish to investigate, or it may be based on an intuitive insight about an idea which then needs to be explored*'. Similarly, David Gray (2018, p.16) describes a hypothesis as:

'an assertion about two or more concepts that attempts to explain the relationship between them. Concepts themselves are abstract ideas that form the building blocks of hypotheses and theories. The first stage, therefore, is the elaboration of a set of principles or allied ideas that are then tested through empirical observation or experimentation'.

These above definitions are aligned with research through design hypotheses (Koskinen *et al.*, 2011; Bang *et al.*, 2012) as well as closely describing the Improvement Matrix as an assertion of nine concepts which form the building blocks of the hypothesis investigated to respond to the research question of this thesis.

Action research questions begin with 'How do I...?', with regard to how action researchers understand what they are doing and how to improve it. Additionally, it often incorporates questions of the form 'What is happening here?'. AR is a research methodology used to address practical problems in almost any real-world setting. Although there are several schools of action research (e.g. classroom action research, action learning, action science, soft systems approaches, and industrial action research), there is a consensus that the main aim of action research is to improve practice through taking action at the local level (Cohen *et al.*, 2018). AR has evolved to be used in research projects with different purposes and focuses. Nevertheless, AR projects share the same approach to research, where participants are conducted to actively research and develop improvements in their practice by themselves (Kemmis *et al.*, 2014), producing action and research outcomes that benefit participants' local practices as well as generate knowledge. The following paragraphs discuss the characteristics of this research methodology and appropriateness of this approach for answering the research question, and the benefits and challenges of action research.

The advantages of action research include its application in work or community situations, its potential to increase the researcher's learning from their experience, its relevant outcomes to practice and the participatory approach (Dick, 1993). Practitioners in partnership with an investigator can use the approach as part of their normal activities as agents of change, improving their learning in their own practice and transforming their personal theories of real-world practice into a desired situation. In this sense, there is a relevant and worthwhile outcome for all involved within the process.

Marlyn Bennett (2004) compiled a list of possible unintended consequences and challenges associated with action research from many researchers. The disadvantages of this method of enquiry include the challenge of working alongside local people and genuine communities interested in the research, the unpredictability of engaging with communities, acknowledging disagreements between groups and the misapplication of the methodology. As negative elements, action research can increase unhappiness of marginal groups by enhancing their awareness of their oppression. Participation can contribute to conflicts of opinion instead of eradicating unfair structures that previously existed. Responses from the rich and powerful to the redistribution of power might not be easily accepted. Paul Johannesson and Erik Perjons (2014) highlight other challenges like the generalisation of results from just one local practice, the impartiality of researchers and practitioners during the studies, and the potential limitations in contribution and participation due to their own work.

David Gray (2018) points out that the main problem in action research is knowing which and how much data to gather. Similarly, Chris Huxam (2003) highlights that AR emphasises an open attitude to data collection and theory building, a challenging aspect of this methodology as there is no predefined methodology for doing that, given that action researchers sometimes tend to deviate from the Research, giving more degrees of importance to the action (Blichfeldt and Andersen, 2006). There are different ways in which researchers can overcome this challenge in order to improve the transparency of research process in action research. One approach is to think in both action and research cycles to clearly differentiate the researcher activity from the practitioner activity, thereby ensuring that the action researchers are doing research, and not only problem-solving as research (Blichfeldt and Andersen, 2006)

David Gray (2018) suggests four different frameworks for assisting the data gathering process.

- Interpretative questions can encourage participants to work on understanding the practice.
- Reviewing an organisation can be focused on analysing various features of the organisation.
- Problem analysis is a way to ask participants to identify the problem itself.
- Concept mapping is used to understand how different key elements in the problem are related to each other.

Bodil Blichfeldt and Jesper Andersen (2006) suggest four ways in which action research can be made a discussable research practice:

- **Increasing transparency of action research processes** – This involves articulating and discussing the framework of ideas brought into the study and analytical generalisation of findings. This was done in the previous chapters.
- **Declaring frameworks brought into action research projects** – This involves declaring the notions and frameworks in advance to improve understanding of the research process. This could draw on tenets of other methods, such as grounded theory or participatory design.
- **Discussing analytical generalisation and transferability of findings** – This involves looking for other types of transferable results that might be taken from specific projects and made available in other situations and settings.
- **Defining appropriate forms of accumulation of results from action research projects** – This involves developing ways to report the research outputs in order to communicate it to a wider audience.

Despite these advantages, challenges and unintended negative consequences, the methodology is broadly used in many fields, such as agriculture, education, engineering, medicine, business and design. A variety of approaches converge in the current action research, making it a multidimensional methodology for social change. Kurt Lewin's paper (1946) is generally considered a landmark of action research methodology, in which he proposed a type of research that could lead to social actions as 'research that produces nothing but books will not suffice' (Lewin, 1946, p.35). Other major sources are Dewey's pragmatic philosophy, social and experimental psychology, community development and adult education, industrial democracy work, human enquiry, action science, action learning, reflective practice, participatory rural development, and liberation theology. What ties all these approaches together is the belief of learning by doing, in which a design skill can be learnt (Lawson and Dorst, 2009). As discussed in section 3.1.2, Lewin's approach was developed in contrast to the scientific approach to research and its concept and implementation of knowledge to improve society, which was later developed into the socio-technical approach, i.e., the roots of participatory design applied as research through practice methodology (Spinuzzi, 2002; Bannon and Ehn, 2012).

Cal Swann (2002) suggests that action research is similar to the action of designing. In the AR process of enquiry, a practitioner identifies a concern, tries a different practice out, reflects on what is happening, and in the light of evaluation, tries a new way that may or may not be better than the current process (McNiff and Whitehead, 2006). This self-reflective cycle that action researchers have to perform is similar to the action of designing, where both actions propose a change in a situation, putting them in a similar theoretical framework. Kemmis and McTaggart (2005) highlight that action research is more than a sequence of steps. It involves a spiral of self-reflective cycles of:

- Planning a change
- Acting and observing the process and consequences of change
- Reflecting on these process and consequences
- Re-planning, acting, observing and reflecting again, and so on...

Several studies in the design field have used action research as a research methodology. For example, Yanki Lee (2008) redefined user participation in design by articulating new roles of designers through the action research approach. In her study, she aimed to change the practice by introducing three new steps into environmental design projects. As a result, she suggested three new roles of designers. Lee's paper can be seen as an example for this PhD research project, since this project seeks to redefine the traditional improvement process by introducing an improvement matrix and a collaborative approach.

In summary, Action research is a type of research that leads to social actions through a combination of problem-solving and research in a real-life situation, where practitioners as active agents of change generate knowledge through practice. AR as a collaborative enquiry remains open to the perspectives of people involved in the process, where the research is about participants reflecting on their own practice through a cyclical process. An AR project generates practical outcomes to improve local practices as well as academic research outputs.

As shown in this section, this research methodology is aligned with the present research project as this research project aims to test a provisional hypothesis through design practice in collaboration with engagement practitioners in order to collaboratively learn and develop their practices and generate a new knowledge as a dual outcome of the process. Additionally, similarities in actions of designing and participatory principles of AR make this

approach appropriate to the context of this research project. However, to ensure that the research in action research is conducted and not only the action of design, the following section reviews research methods appropriate to respond to the thesis research question as potential theoretical frameworks to support the transparency of the research process in action research.

5.3 Action and research methods

A literature survey of research methods used in design for answering 'how' questions shows that grounded theory, ethnography, case study research, and design experiments are appropriate for this purpose. Considering that action research is participatory and similar to the action of design, this section also reviews participatory design as a potential method to conduct action in this research enquiry. This section reviews these methods, considering how they applied for answering research questions, looking at their advantages and disadvantages and their application in design studies. It concludes with an overview of research methods, providing the rationale for the research methodology used in this thesis.

5.3.1 Ethnography

Ethnography involves an intense study to understand the culture of a group of people. The general question is 'What is going on here?', which a researcher attempts to answer by taking notes and recording as much as possible, looking at a social situation. The research begins with broad descriptive questions such as 'What people are here?', 'What they are doing?' and 'What is the physical setting of this context?' (Spradley, 1980).

Ethnography is a research method, originating in anthropology, used for describing and explaining the culture of a group of people. It involves attempting to answer questions regarding the ways of life of human beings, and its link between culture or behaviour and/or how cultural processes develop over time (Rodgers and Anusas, 2008). Ethnography is performed through observing, listening, conversing and engaging with groups of people for an extended period of time, in order to obtain a 'native's point of view', known as 'emic' perspective (Rodgers and Anusas, 2008).

This long period of engagement is required to blur the researcher and participants and to understand contexts for designing an intervention, in order to obtain reliable results (Barab *et al.*, 2004). On the one hand, this considerable amount of time allows the researcher to uncover the culture of a specific group of people and understand the process that natives put upon events or situations in their context. On the other hand, ethnographic studies can be time consuming, since the researcher needs to build trust, and this can be dangerous if the researcher does not understand the culture of a group of people.

Luisa Nurani (2008) lists the main advantages and disadvantages of this method. The benefits of ethnography research come from its observational technique. This technique allows a researcher to record participants' behaviour to uncover and describe a phenomenon in a social context from the natives' perspective. One of the disadvantages of this method is that the participants might present an ideal behaviour or provide statements that a researcher would like to perceive, affecting the researcher in terms of accurate description. Another disadvantage is the limited generalisation of this method. The particular setting in which a study is contextualised might make difficult the generalisation of the findings. Although there are suggestions to overcome these limitations, such as not accepting the first impression as valid and multisite studies and variations, they will grow ever more laborious, requiring the researcher to look at different situations and do more research training.

In the design field, ethnography has been used in different ways, from human-centred design to a more participatory design practice. Professional designers have used ethnography to understand how to better design and sell products (Salvador *et al.*, 1999; Wasson, 2000; Rodgers and Anusas, 2008). Ethnography is widely used in PD to study design practices on everyday settings, taking a holistic stance in order to provide a rich description of practitioners' perspectives (Blomberg and Karasti, 2012). PD researchers applied ethnography to introduce information and communication technologies where local residents of African rural communities were included in the ethnography data collection and analysis (Winschiers-Theophilus *et al.*, 2012). Another example involves applying ethnography to co-design materials for co-authoring future scenarios (Johansson, 2006; Buur and Matthews, 2008; Halse and Boffi, 2014). In summary, different ethnography approaches in participatory design are applied for minimising contexts of use and design, creating familiarity and empathy with stakeholders (Smith and Kjærsgaard, 2015).

To sum up, ethnography aims to describe a phenomenon within its social and cultural context through an intense study in the fieldwork in order to develop a thick description. It focuses on understanding the culture and its situation to develop new products and services in initial phases of design, or to create familiarity and empathy through a long engagement period in order to, for example, introduce new technologies or co-create design materials to explore possible futures. However, this research project looks at understanding how a framework works in practice. It does not focus on studying one particular context for a long period or creating new products but looks at insights that people can provide to generalise the findings of an improvement process. Although it is possible to generalise from ethnography to theory (Iacono *et al.*, 2009), the long-period engagement of ethnography make it unsuitable for this project.

5.3.2 Case study research (CSR)

CSR is a commonly used method for exploring processes, activities and events (Creswell, 2014). CSR is an intense study of one or multiple cases within real-world contexts that focuses on describing, understanding, predicting, and controlling a unit (Woodside, 2010). CSR can be defined as:

'a qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports), and reports a case description and case themes.' (Creswell and Poth, 2018, p.97)

A case is a spatially delimited phenomenon (a unit) usually comprised of individuals that is observed at a specific point in time or over some period of time. It has identifiable temporal and sometimes spatial boundaries, for instance, periods of crises or countries (Gerring, 2006). However, the boundaries between phenomenon and context may not be clearly evident and the individuals (i.e., process, animal, person, household, organization, group, industry, culture, or nationality) are not perfectly representative of a population of a case (Gerring, 2006; Yin, 2009). 'It may be a community, a relationship, a decision process, or a specific project' (Creswell and Poth, 2018, p.98).

CSR is used as the preferred method to answer 'how' and 'why' questions and less frequently 'what' research questions (Yin, 2009; Helena *et al.*, 2017) and is appropriate for a broad range of research objectives: description, explanation, prediction, and control of individual process, individual, group or organisation (Yin, 2009; Woodside, 2010). Descriptive

objectively involves attempting to answer who, what, where, when and how questions. Explanation is the attempt to answer a why question. Prediction includes forecasting psychological states, behaviour or events. Control attempts to influence cognition, attitudes and behaviour. Any combination of these objectives may serve as the major focus of this approach. Essentially, case study research tries to shed light on a decision or set of decisions: why they were taken, how they were implemented, and with what result.

Arch Woodside (2010) proposes that deep understanding is the principal objective of case study research. The deep understanding of the actors, interactions, emotions and behaviours occurring in a case involves the knowledge of sense-making created by those involved in the process under investigation. The sensemaking process is how individuals (i.e., person, group, and/or organization) make sense of stimuli, i.e., what they perceive and how they frame this perception, and interpret what they have done, including a detailed problem-solving process and results of the enactments of these individuals (Woodside, 2010). To achieve this deep understanding, researchers should rely on multiple sources of evidence across multiple periods of time, with data needing to converge in a triangulating approach. The convergence of data helps to strengthen the validity of a case study. This triangulation often involves a direct observation within the environment of the case, interviewing participants and analyses of written documents and natural sites (Woodside, 2010). The data analysis should follow an analytic strategy comprised of examining, categorising, tabulating, testing or recombining evidence in order to draw empirical conclusions.

The three major advantages of this method are the holistic approach, the potential generalisability of findings, and the richness of data. Firstly, researchers often conduct the process of enquiry within the context that an activity takes place, instead of isolating the phenomenon from its context or historical information (Yin, 2009). Secondly, findings of a particular case can be transferred to similar situations, if the general lies in the particular, which can be seen as a small step in developing new theories, and therefore, allowing generalisation, although not all studies emphasise generalisation (Stake, 2005). Thirdly, the qualitative data gathered in case studies research not only helps to explore or describe real-life situations, but also to explain complexities, which would not be possible through quantitative methods (Zainal, 2007).

Case study research also has some disadvantages. Firstly, it is difficult to generalise a study from a single case (Yin, 2009), although this does not usually happen. Secondly, summarising and developing general theories based on specific case studies is hard (Starman, 2013). The third limitation is related to reliability and validity of the results regarding a potential researcher's bias. The researcher's subjectivity may introduce doubts, prejudice and lack of rigour, allowing equivocal evidence to influence the direction of the findings (Yin, 2009). To understand the application of this method, a design study is presented as an example, as follows.

Dolonen and Ludvigsen (2013) carried out a case study research on how the co-design of educational software is an activity mediated by and through communicative resources. It aimed at contributing to the understanding of the aspects of collaboration in design in order to make clear the complexities of this social and interactional phenomenon. That is, the decisions or set of decisions of the negotiation of design suggestions. Although the study is contextualised within a co-design of educational software, in a particular situation, this is a step toward developing a theory in co-design that can be generalised to other co-design contexts. The researchers of this study found that the design trajectory varies in how the

participants orient themselves, and tensions make visible which communicative resources are sensitive to what they perceive as relevant for their context.

In this thesis, the research question 'how can knowledge exchange tools be improved?' fits the objective of case study research. This study is situated in a real-life context with little control of events and studied in a holistic way, considering the relationships and processes within the tool improvement practice. Therefore, case study research seems to be appropriate to the purpose of this project, due to the above-mentioned characteristics, which enable the researcher to gain deep understanding of tool improvement processes.

5.3.3 Grounded theory (GT)

Like case study research, grounded theory is also a commonly used method for exploring processes, activities and events (Creswell, 2014), such as the improvement in tools that is the focus of this thesis. This research method generates theory grounded in data collected from social phenomena through a systematic analysis of data in order to develop a deep understanding of a specific situation. Carla Willig (2013) recommends that questions in GT should be open-ended, guiding the researcher towards action and process. The 'how' question stated in this thesis can be used as an example for this method. GT is not compatible with 'what' and 'why' questions because they orientate the researcher to states and conditions.

GT was first published in the seminal book 'The discovery of grounded theory' authored by Glaser and Strauss (1967). This research method generates theory inductively derived from a systematic analysis of data in order to understand social-psychological processes in their natural setting (Willig, 2013). The inductive research initiates with a data collection through intense interviews, field notes, journal reviews, etc, rather than a specific hypothesis. The data collection is concurrently performed with data analysis and theory generation using a constant comparative method of analysis (Lee and Cassidy, 2007). Hussein et al. (2014) list five advantages and disadvantages of this research method described in the following paragraphs.

The main advantages of GT are its conceptualisation potential, systematic approach, intuitive appeal, ability to foster creativity, and its approach to collect rich data. GT has a unique ability to generate concepts from empirical data, which is derived from a logical and continuous data analysis approach of comparing, coding and memoing. This approach has an intuitive appeal for new investigators because it allows them to immerse themselves deeply within data by providing explicit guidelines to carry out the research. Additionally, GT does not start with testing a hypothesis, encouraging researchers to move through a process of discovery that naturally emerges from data, using a creative and inductive process. Finding data is the beginning of this discovery process. Researchers should look for rich data, expecting to seek thick descriptions through writing field notes of observation from narratives.

The disadvantages of this research method are its multiple approaches, its exhaustive process, and its high potential for methodological error, controversial use of the literature review, and limited generalisability. The distinct notions of grounded theory practices of the authors of the book, *The Discovery of Grounded Theory* (Glaser and Strauss, 1967), have created a conflict in the application of GT (Bryant and Charmaz, 2007), leading to at least the generation of four approaches, which resulted in confusion among scholars. The ability to generate concepts through the systematic analysis of data is a time-consuming and exhaustive process, as the process of abstracting concepts is not an easy task.

There are potential methodological mistakes new researchers can make in GT, such as the data collection detached from an emerging theory, the use of one source of data (Hussein *et al.*, 2014), muddling qualitative methods, generational erosion, premature closure and methodological transgression (Wilson and Hutchinson, 1996), difficulties with micro-analysis and coding (Allan, 2003). Another disadvantage is that the literature review without developing assumptions is still in an open discussion, and sometimes, discourages the use of GT. The generalisability is also controversial and can be partially achieved through a process of abstraction. The range of situations to which the findings can be applied or referenced is limited, due to a specific condition under which a phenomenon is studied in GT (Corbin and Strauss, 1990).

In the design field, the grounded theory method has been used to understand the design activity of designers. For instance, Feast (2012) studied the designers' social process of collaboration in their work, which generated insights into how professional designers understand collaboration. Gerber and Carroll (2011) studied the designers' psychological experience of an enactment activity, which resulted in a suggestion of three psychological outcomes when practitioners engage with prototyping. Lee and Cassidy (2007) used a hybrid methodology, a combination of grounded theory method and KJ method, to study principles of leadership, which resulted in five principles of better design leadership for industrial designers in Taiwan. These examples have shown that grounded theory method is more appropriate to understand social-psychological design processes.

Overall, the main characteristic of grounded theory is the theory generation from data rather than from a hypothesis. It is searching for theoretical explanations rather than existing theories. A theory emerges from a concurrent data collection and analysis through a systematic process grounded in a specific context, in which generalisation is limited. Since this research project engages with a theoretical framework (4.2) and is not only looking at the social-psychological process, but understanding the interactions, behaviours of a group of people in a holistic way, not grounded in a specific cultural context (e.g. natives of a specific region), the grounded theory method, therefore, is not the most appropriate research method for this research project.

5.3.4 Experimental method

Experiments are commonly used in science studies, as a quantitative method for establishing cause and effect relationships. Such relationships can be formulated as a hypothesis, such as 'X causes outcome Y'. Experiments are performed through the control of variables and observations by measuring changes in laboratory or field settings. The purpose of an experiment is to confirm that one factor has a certain effect on another factor by controlling other factors that might affect the hypothesis in laboratory settings. However, Brandt and Binder (2007) highlight the application of experiments in design research which have been recently used within more broad and explorative research questions.

Brandt and Binder's paper explores programmes of PhD theses that are guided through 'how' research questions to support how the knowledge generated in design experiments substantiates design issues. The role of design experiments is to explore a program situated in a broader question, which evolves as the design research develops. Similarly, others have discussed the difference of experiments in science and in design (Schön, 1983; Glanville, 1999). This section explores how experiments are traditionally used in scientific research, describing its planning components, and how it has been applied in design research.

John Creswell (2014) highlights 4 general components to develop an experimental method plan: (a) participants, (b) materials, (c) procedures, and (d) measures:

- a) **Participants** involves the selection, assignment and number of participants who will take part in the experiment. Researchers can select participants nonrandomly or randomly, providing the rationale for either choice.
- b) **Material** consists in the instrument(s) used for measuring the data collected in the experimentation.
- c) **Procedures** involves the experimentation type, providing reasons for the design. Experimentation types differ by how groups are controlled, group characteristics, and ways to assign participants.
- d) **Measures** or variables are the characteristics or attributes of an individual or group that can be measured or observed, which can vary among the individuals or group studied.

Benefits of lab experiments include the possibility to replicate the study, and if an experiment is well-designed, it can ensure individual behaviour can be captured appropriately (Brüggemann and Bizer, 2016). Lab experiments ensure precise measurements, and the researcher has almost complete control of the situation. Experiment findings can allow generalisation due to its controlled characteristics and protections against bias (Creswell, 2014).

The disadvantages of this research method are related to the artificial environment of lab experiments and the participants' behaviour and selection. Lab environments might influence their behaviours and might not induce realistic activity during an experimental situation. Participants might try to behave in a way that is expected by the researcher, and they often cannot learn and adapt their behaviour accordingly in experimental settings. Furthermore, participants are considered unrepresentative of the overall population, and there are potential selection biases in the process. Lab experiments are considered as lacking external validity, since they might produce unrealistic data for understanding the real world. The artificiality is an issue for the generalisation of findings. Therefore, researchers need to assess and determine whether a generalisation can be made.

Although the experiments can also be used in field settings, it has a slightly different approach as well as disadvantages (Christensen, 2003). In a field experiment, the research is conducted in a real-life setting, where the researcher manipulates and controls variables. The main disadvantage is that the control of incidental variables cannot be performed in the same way as in laboratory settings. Field experiments are not subject to the artificiality problem, although the participant selection bias may exist in the method due to lack of control of real-life settings. For instance, Christensen (2003) supports these characteristics in an experiment, where a female shopper's appearance influences the amount of time an employee of a store takes to approach and acknowledge her. In his example, the type of dress is the variable manipulation, and the stores were randomly selected. However, store employees were not randomly selected.

In design research, researchers have applied and re-interpreted the experimental method, considering the limitations of its use in quantitative approaches, and becoming aware of a more natural approach, where human beings are concerned in the design process in the light of design's orientation toward intended change (Brandt and Binder, 2007). In other words, experiments in design are a mix of real-life and design settings, where there may be a controlled environment to protect the setting but it does not measure or standardise processes.

Brandt and Binder (2007) understand design experiments as a means to explore design professional issues they called program, and analyse three PhD theses to argue how experiments became arguments in knowledge generation. Along the same lines of design professional practices, Krogh et al (2015) suggests five different ways of applying design experiments to explore and describe design research. Therefore, experiments seem to be appropriate to the purpose of this project due to the above-mentioned characteristics, the possibility to explore a design community issue (program) and its application to answer the how question posed in this thesis.

5.3.5 Participatory design as a practical method to conduct action

PD has its roots in AR, which is characterised as research methodology that explicitly points to changes in the investigated field. As discussed in Section 4.3, AR has been used to address practical problems in various settings and evolved into a number of different orientations, one of which is PD. PD is a practical method in which research through design can be carried out as a means for action.

PD as a method is appropriate for

‘investigating current practices, with tools for creating descriptions (and other intermediary) or for facilitating creative workshops where users collaborate with designers on envisioning future work systems and future information technology support’ (Bratteteig et al., 2013, p.119).

In this method, two potential techniques used for carrying out the research through the practitioner activity of shedding light on a proposition, creating something, embodying and testing (Archer, 1995) are described in the following paragraphs: future workshop previously discussed in Section 2.2.4, (Kensing and Madsen, 1992) and bricolage (Büscher et al., 2001; Büscher et al., 2004).

The future workshop is divided into three phases: **Critique** (present situation), **Fantasy** (imagining the desired), and **Implementation** (setting up plans to implement). In the first phase, participants had to draw out specific issues in the work in the workplace; In the second phase, participants were free to propose ideas on how the workplace could be different. This approach provides a framework for looking at current working environments, and propose potential improvements to the workplace, enabling workers to take active part in contributing with their knowledge and skills and in fixing issues in the system.

Kensing and Madsen (1992) proposed the use of metaphorical design (Lakoff, 1980) to stimulate seeing things in new ways through the future workshop technique. In their study, they present a scenario taken from a project at the Danish research libraries. They worked with library practitioners using metaphors as a tool to support them to reflect on their current activities and stimulate their visions of alternative solutions for a computer system, which supports the information retrieval, circulation control and cataloguing activities. Metaphorical design is further developed based on five case studies, from which Kim Madsen (1994) provides guidelines according to three main activities: generating metaphors, evaluating metaphors, and developing metaphors. In this scenario, the application of the future workshop technique provided a structure to test the metaphorical design, enabling researchers to develop further understanding on the metaphorical design proposition. In a similar application, the future workshop can provide a structure for testing the Improvement Matrix in order to develop a deep understanding of how it works in practice.

Bricolage is a French word used by Levi-Strauss (1972) to describe a creative skill to use any material at hand to create something new. In PD, the bricolage technique has been originally applied for:

- (1) assembling and integrating prototypes (technologies, devices and tools) for making work in practice within particular means, such as tools for demonstration, or for collaboration (Büscher *et al.*, 2004).
- (2) designing systems for cooperative work using ready-to-hand materials, combinations of existing pieces of technology (hardware, software and facilities), and off-the-shelf items (Büscher *et al.*, 2001)

This technique suits learning by trial-and-error (3.3.3) as it takes into account experience, intuition, uncertainty, and complexity in situations that action research (Coghlan and Brydon-Miller, 2014) and design deal with (Swann, 2002).

5.3.6 Discussion

This review of methods has shown that the case study (CSR) and design experiments are the most appropriate research methods for answering the research question of this project, discussing why the others are less appropriate. In grounded theory, the theory generation from empirical data rather than from a hypothesis would not consider the theoretical framework developed in Chapter 4 and would limit the generalisation of the research findings. In regard to ethnography, even though its observational technique is an advantage with this method, a native perspective of particular culture and context and a long-period engagement with a situation are not the focus of this project. On the contrary, it focuses on changing and understanding real-life practices, which consist of intervening in KE design practices through the improvement of tools over a short period of time, which case study research focuses on.

Action research seeks to improve real-life practice through action. This research methodology is recognised in the Research through Design (RtD) approach, where action and research are communicated and conducted through activities of design (Frayling, 1994). The recording of action research and case studies reports can be combined as both approaches include ‘thick description, deep understanding, and attempt to influence the design and outcomes of behaviours occurring in a case, without attempting to build predictive models for estimating values of proposed dependent variables’ (Woodside, 2010, p.12). This PhD thesis seeks to report the application of RtD as design case studies in order to promote best practice and add to the body of knowledge in the field of design (Swann, 2002).

Design experiments and case studies have a similar approach to research. Both research methods develop a ‘thick’ description, involve observations to understand a phenomenon, have similar methodology for multiple studies, allow generalisation, and are limited by identifiable boundaries. In fact, the redesign of scientific experiments has made design in RtD very similar to case study research, although experimental control such as variables, and sampling designs are still present in design experiments, as presented in the textbook ‘Design research through practice from the lab, field, and showroom’ (Koskinen *et al.*, 2011).

The methodological difference between experimental and case study research strategies is the rationale underlying the replication in case studies in contrast to sampling design in experimental research. Robert Yin (2009, p.248) highlights that ‘*a major insight is to consider multiple cases as one would consider multiple experiments—that is, to follow a ‘replication’ design*’. It is the replication of experiments that makes research findings robust. In other words, outcomes of a single experiment need to be replicated by conducting a second, third or even more experiments with similar conditions to the original experiment to see whether

the finding could be duplicated. The rationale for using multiple-case studies is the same. Each case must be carefully selected to predict similar or contrasting results. As shown in Section 4.2, each layer of KE practice provides complementary results, where tools are improved in a complementary way as described in Section 4.

Despite these similarities and differences, case study research is more appropriate for the improvement practice explored in this thesis as it provides a useful framework that leads to an in-depth understanding of processes, practices, and relationships in context, where the context and issue are unclear and contain many variables (Helena *et al.*, 2017). Furthermore, AR and CSR research involve investigating a how question, a theoretical proposition as a provisional hypothesis that is open for further modification. That is, the improvement matrix as the theoretical proposition of this PhD research. The following sections present the research design and the research strategies for data collection and analysis and for sharing results.

5.4 Research design

The research design of this PhD study reflects the research through the medium of engagement practitioner activity of co-designing improvements of tools using **action research methodology**, where the researcher tests the Improvement matrix through the **combination of participatory design and case study research methods: a case study through RtD**. This study aims at developing a deep understanding of the improvement matrix through a multiple-case study and producing redesigned versions of tools for participants of this study as academic and practical outcomes. This reflects the essence of action research, where it facilitates a dual creation of knowledge and artefacts. To make the action research project a discussable research practice (Blichfeldt and Andersen, 2006), this section presents the theoretical framework brought into study, the analytical generalisation (transferability) of findings, and the ways the results are reported.

The action research process is **strongly oriented by case study research as a theoretical framework for gathering, analysing and reporting data** in order to enhance the acceptability of action research as a form of research. The research process follows the case study phases of planning (plan / prepare / collect), acting (collect), observing (analyse), and reflecting (share) (Yin, 2018). These research phases reflect on how the case studies chapters are structured in Part B of this thesis. A multiple-case study started with the theoretical propositions that functionality, instruction, and flexibility work in different layers of the knowledge exchange design practice, as presented in Chapter 4.

The research design adopted by the researcher in this thesis uses a combination of techniques suitable for the investigation of practices known in RtD as a pick-and-mix approach as a form of bricolage (Yee, 2010). The future workshop technique is employed to shed light on the design proposition of this thesis. That is, the improvement process of tools that considers the relationship between the landscape of KE design practices and the dimensions of tools presented in the Improvement Matrix framework (4.2). The bricolage technique is also employed in the action of co-designing improvements, where it is applied to nourish the imaginative ability of participants, to document the process and to support the participatory redesign of tools.

To make clear the action and research practices in this action research project, where participants are co-researchers undertaking each of the steps in the spiral of self-reflection

(Kemmis *et al.*, 2014) and the researcher conducts the practice of research, the following table presents the action researcher and participants' cycle:

Table 7. The action research cycle in this research project

Action sequence	Action researcher's Enquiry PD (Action) and case study (research) (Theoretical frameworks)	Participants' Practice Future workshop + Bricolage (Co-designing improvements of tools)
Plan	Planning, preparing and collecting evidence through improvement workshops to understand the practice	Planning, preparing, identifying issues in the tools to change their practices
Action	Evidence gathering Delivery of improvement workshops within the context of practice	co-designing ideas for the improvement of tools
Observe	Evidence analysis the changes in theory and practice	the improvement proposals
Reflect on	The action research findings	The proposals that will result in improvements in their practice

Following the frameworks discussed in Section 5.2, the first step in AR or CSR is to build a theory that can be used to improve knowledge exchange tools. This was done through a literature review, where the **Function, Instruction and Flexibility** were identified as part of the improvement framework. The second step is to design activities around these aspects in order to understand how they are related to each other. These activities include questions in the form of tasks to encourage participants to work through the identified aspects in order to understand the how improvement occurs within the overlapping KE design practices (**Design, Facilitation, Application**). In each of these practices, participants are involved in creative problem-solving and analysis to identify which changes lead to the improvement of their practices. This is done through a RtD approach, where a participatory design method, tenets and guidelines for the OD and improvement of tools (3.3.2 and 3.3.3) are implemented through the future workshop and bricolage techniques and supported by the theoretical framework developed in Chapter 4 as follows.

Table 8. Improvement matrix

Dimensions Layers	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
DESIGN	Interaction models	Challenge / Briefing	(Build) Resilience
FACILITATION	Resources produced by facilitator	Facilitator notes	(Encourage) facilitator response
APPLICATION	Design of material	Example or use notes	(Enable) Contrary activity

In the action research project called Improve It, the action of improvement (3.1) is performed within a co-design approach (2.2.7), where engagement practitioners work together to learn and reflect on the framework for improving tools (4.2) as active agents of change to develop their KE design practices (4.1). Each group of engagement practitioners, who are focused on understanding how to improve tools to develop their practices, represents a case study of this research project. While the action researcher explores and collects multiple sources of evidence to develop a thick description of the improvement process, participants reveal their understanding through interactions, discussions and thoughts during the engagement with other participants within improvement workshops.

In this research project, each case study consists of testing and analysing a layer of practice for improving tools (4.2) in a real-world context with little control of events. A descriptive case study of each workshop aims at presenting a thick description of the improvement framework within the practice of co-design in order to develop further understanding of the Improvement Matrix and to shed light on a set of decisions: how they were implemented, and with what result. In this type of case study, the researcher must begin with a predicted description to support the empirical description of the phenomenon or story prior data collection (Zainal, 2007; Yin, 2018). This predicted description is presented in Section 4.2.

As discussed in Section 5.3.6, a multiple-case design is chosen to test the three dimensions of tools within similar workshop conditions, where each selected layer of practice (case) tested through workshops is claimed to improve tools in a complementary manner (similar results) as described in Section 4.2. In this multi-case design, if the findings support the predicted descriptions, it will represent that the Improvement Matrix a strong start toward a theoretical replication. The generalisation in this thesis is not about applying the results to a wider population but developing transferable findings or limited generalisations. This is done through sharing and communicating the multiple-case study results and findings in order to raise awareness, provide insights, and suggest solutions to the Improvement Matrix framework. The research strategy for gathering and analysing workshop evidence and sharing results is discussed in the following section.

As an investigation carried out through the medium of practitioner activity of design, each case is part of a series of improvement workshops. The definition of engagement practitioners includes design researchers specialised in participatory approaches and people who work with groups of non-designers, such as community leaders or professionals working in the public sector, who aim at involving people in public decision-making processes. In these workshops, a group of engagement practitioners, who actually work with tools and are genuinely interested in getting tangible benefits of improved tools, work in partnership with the researcher through experimenting, learning and reflecting on the process of improving tools as active agents of change, providing evidence to test the improvement matrix (4.2). Therefore, multiple-case studies as a part of the spiral of the action research self-reflective cycle is defined as the methodology performed in this PhD research project. Each case constitutes a cycle of the action research of **planning, acting, observing and reflecting** (Kemmis and McTaggart, 2005) as illustrated below:

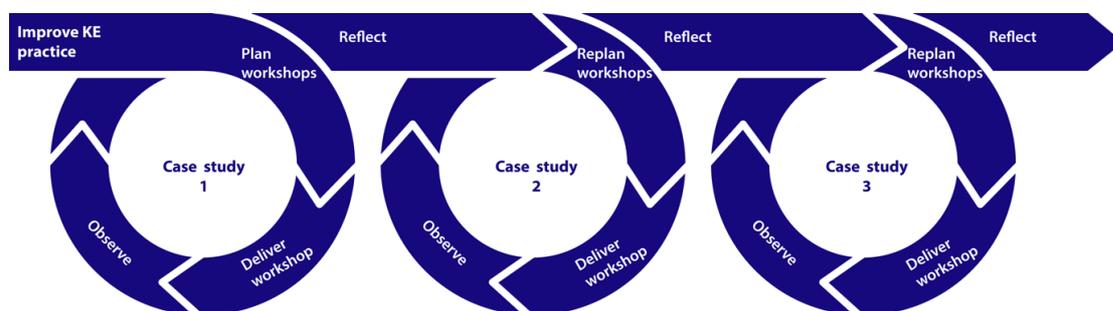


Figure 2. Research design

These improvement workshops follow the design principles to improve tools presented in Section 3.3, where participants actively co-design improvements and evaluate Leapfrog tools (democratic practice through learning by trial-and-error), considering their everyday design practices of engagement taken at the actual settings (situated-based actions, 4.1), in order to develop new versions of tools (alternative visions about a technology created by ‘users’). It is through the medium of practitioners’ activity within workshops that practical knowledge is

generated to test the Improvement Matrix proposition. As discussed in Section 5.2 and presented in Table 7, this practice of design can be considered as the practitioners' action research of design in this thesis, where participants identify issues and co-design improvements looking at the functionality, instructions and flexibility of tools, and then learn and reflect on which proposals lead to the improvement of their practice (Figure 3). Participants' actions of co-designing improvements within workshops are described more in-depth in Part B.

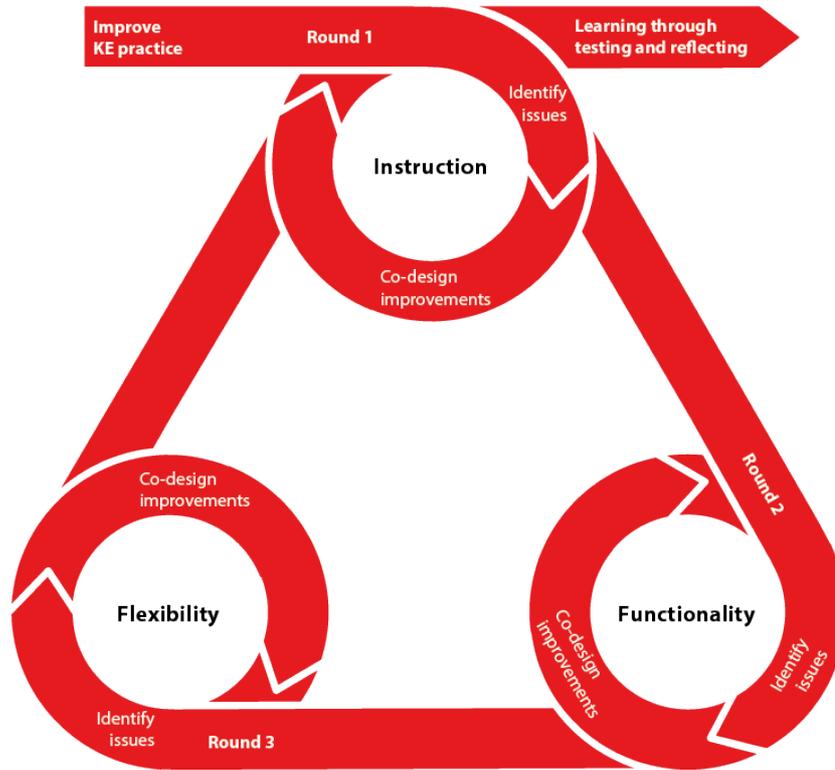


Figure 3. Practitioners' action (research) of design

The figure below illustrates the research design structure of this PhD investigation that seeks to answer the research question: **How knowledge exchange tools be improved?**

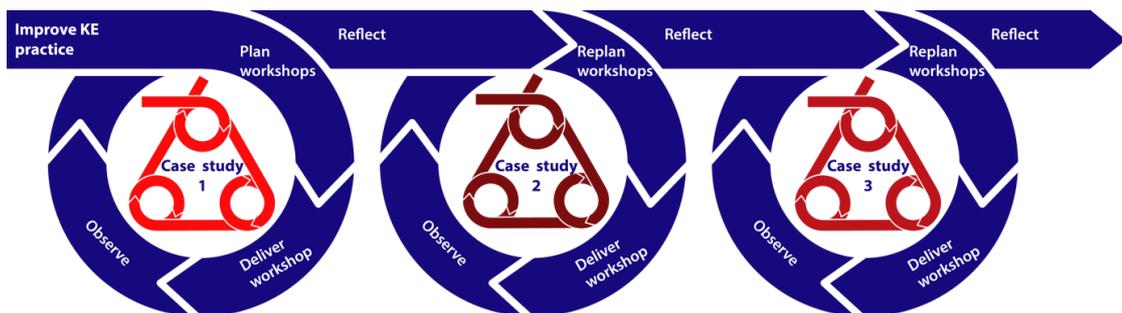


Figure 4. Research design structure

Although the spiral of reflection is represented by cycles, in practice the process is rarely neat, as illustrated in the figure above. In reality, the action research process is more fluid, open and responsive (Kemmis *et al.*, 2014). In this PhD study, a linear format of the plan, act and observe and reflect stages is used to provide an overview of the research design, activities and structure of this thesis. The process of gathering and analysing additional information to extend the understanding of the improvement framework, and sharing conclusions are conducted through case study procedures that is illustrated in the table below and further described in the following section.

Table 9. Research design overview

Thesis	PART A	PART B	
AR stages	Planning	Acting and observing	Reflecting
CSR framework Adapted from Yin (2018)	Design and prepare <ul style="list-style-type: none"> • Define cases to be studied • Develop theory • Identify the case study design • Ensure rigour 	Collect and analyse <ul style="list-style-type: none"> • Watch for promising patterns, insights, and concepts • Case study protocol • Develop a general analytic strategy 	Share <ul style="list-style-type: none"> • Starting early, compose textual and visual materials • Display enough evidence for reader to reach own conclusions • Review and recompose until done well
How	Literature review: (Chapter 2,3,4) <ul style="list-style-type: none"> • Theory building Research methodology (Chapter 5) <ul style="list-style-type: none"> • Cases definition • Rigour criteria • Data gathering • Data analysis • Case study structure 	Action plan (Chapter 6, 7) <ul style="list-style-type: none"> • Workshop plan and delivery Analytic strategy (Section 5.5.3) <ul style="list-style-type: none"> • Framework of analysis 	Sharing and communicating the results (Chapter 7, 8) <ul style="list-style-type: none"> • Case study reports • Cross-case conclusions • Validation Conclusions Chapter 9 Conclusions, limitations and future research

5.5 Research strategy

This section presents a series of research techniques that are determined to best meet the research aim of this thesis. The Section 5.5.1 describes the criteria used for judging the quality of the actions and research that was taken in each phase of this action research project, linking the techniques employed to meet these criteria. The following sections describe the techniques used for gathering evidence (5.5.2), analysing evidence (5.5.3), and reporting research findings and conclusions (5.5.4).

5.5.1 Criteria for judging the quality of research design

To ensure rigour in this research project, four-dimension criteria were employed by the researcher, using recommended tactics and strategies described by Guba (1986) and Shenton (2004). These rigour criteria and the tactics are described in the table as follows.

Table 10. Quality criteria and research strategies used in this research adapted from Forrero et al. (2018, p.3) and Lincoln and Guba (1986) and Shenton (2004)

Rigour criteria	Original strategies (Lincoln and Guba, 1986)	Provision made by the researcher in this thesis
<p>(1) Credibility To establish confidence that the results (from the perspective of the participants) are true, credible and believable</p>	<ul style="list-style-type: none"> • Prolonged and varied engagement with each setting • Interviewing process and techniques • Establishing investigators' authority • Collection of referential adequacy materials • Peer debriefing 	<ul style="list-style-type: none"> • Adoption of appropriate, well recognised research methods • Different types of Triangulation (Patton, 2015): use of different methods (methodological triangulation), different types of informants (data triangulation), different perspectives to the same data set (theory triangulation), and different evaluators (investigator triangulation) • Debriefing sessions when a workshop was co-facilitated • Multiple voices (collective case study) • Tactics to help ensure honesty in informants: genuine interest from participants to get practical benefit from the project. • Peer scrutiny of the research project: Conference presentations (DRS2018, EAD2019) • Researcher's reflective commentary • Background, qualifications and experience of the investigator at the introduction of this thesis • member checks: in this action research project, participants generate their own evidence. • Audience review (Credibility triangulation): Intended users of the framework (Patton, 2015)
<p>(2) Transferability To extend the degree to which the results can be generalized or transferred to other contexts or settings.</p>	<ul style="list-style-type: none"> • Purposeful sampling to form a nominated sample • Data saturation 	<ul style="list-style-type: none"> • Thick description: narratives developed about the cases are described in the following chapters. • Review of case studies with experts in participatory design, co-design and tools
<p>(3) Dependability To ensure the findings of this qualitative enquiry are repeatable if the enquiry occurred within the same cohort of participants, coders and context.</p>	<ul style="list-style-type: none"> • Rich description of the study methods • Establishing an audit trail • Stepwise replication of the data 	<ul style="list-style-type: none"> • All details of the methodological approach are presented in this chapter
<p>(4) Confirmability To extend the confidence that the results would be confirmed or corroborated by other researchers</p>	<ul style="list-style-type: none"> • Reflexivity • Triangulation 	<ul style="list-style-type: none"> • Several triangulation techniques are applied in this research • Personal accounts were produced for each case study

In the following sections, the summary of provisions employed in this thesis is described in more detail, as most of them occurred during the data collection, data analysis, or compositional phases of research (Yin, 2018). Although these criteria of quality represent a rigorous research, they little acknowledge its utility (Lincoln and Guba, 1986) and its action-

oriented outcomes (Stringer, 2007; Herr and Anderson, 2015). In order to extend these criteria for action research – whose goals are to generate knowledge and contribute to new practices beyond knowledge generation – a mix of other criteria is employed to do a good action research. These criteria involve (1) worthwhile practical purposes (Reason, 2006) or pragmatic/utilization-focused criteria (Heikkinen *et al.*, 2007; Patton, 2015), (2) evocativeness (Heikkinen *et al.*, 2007; Patton, 2015), (3) participatory and collaborative (Herr and Anderson, 2015; Patton, 2015). These criteria for action research extend and overlap with the ones presented in Table 10, and most of them occurred during data collection and compositional phases as shown in the table below.

Table 11. Action research quality criteria

Rigour criteria	Provision made by the researcher in this thesis	Research phases in which the criteria are addressed
(1) Worthwhile purpose (Reason, 2006, p.191) or Pragmatic/utilization-focused (Heikkinen <i>et al.</i>, 2007; Patton, 2015, p.14) to consider the practical consequences of research on the study subjects and researchers as well as the scientific community, society and the whole of mankind.	Designed an action research that contributes to the practitioners’ practice of knowledge exchange, participatory design, and co-design	Designing, preparing, collecting, analysing, and sharing
(2) Evocativeness (Heikkinen <i>et al.</i>, 2007, p.15; Patton, 2015, p.687) to evoke emotions in the reader, to restore from the sediments of memory similar personal experiences and mental images or to alter the reader’s prevalent mind-set.	Explained choices in composing narratives: textual and oral case study presentations (conference presentations and creative conversations)	Sharing and communicating the results
(3) Participatory and collaborative (Herr and Anderson, 2015, pp.68-69; Patton, 2015, p.690) to what extent problems are framed and solved in a manner that permits ongoing learning of the individual or system the extent to which research is done in collaboration with all parties who have a stake in the problem under investigation	Designed a collaborative research, where multiple perspectives were taken into account in this study. Participants are co-researchers who do research and evaluation in this process of enquiry.	Collecting, analysing, and sharing

5.5.2 Documenting and gathering evidence (Data)

Improvement workshops are designed to collect multiple sources of data, in order to develop deep understanding of the process of improving an engagement tool, by exploring participants’ thinking processes and discussions through which their implicit understanding of the improvement process is revealed. As discussed in Section 5.2, AR hypotheses are provisional in the sense that they are open to further refinement. Action researchers ‘do not hypothesize an answer to the research question but seek to understand the nature of events – how and why things happen the way they do’ (Stringer, 2007, p.65). This differs from traditional hypothesis testing, where the nature of hypotheses is to test a theory to falsify it or refute it. In this thesis, the term evidence or information to refer to data, usually used by scientists (Kemmis *et al.*, 2014), is used to understand how things work, as historians do. The following kinds of evidence are used for developing understanding in the practice of improving tools.

As in case studies research, evidence is collected from multiple sources through all phases of the future workshop technique (**critique, fantasy, and implementation**). One source of evidence involves the direct observation of the participants' interactions in the workshop. The second source of evidence involves the outputs of the process resulted from participant-observation and completed tools. The third source of evidence is the participants' reflection and general feedback of the workshop. Each case study represents a layer of practice (**design, facilitation and application**) that has embedded subunits of analysis: **functionality, instructions, flexibility**. In this research, different kinds of evidence come from multiple sources. Documentation of each case study consists of two separate collections: one is a portfolio of different kinds of evidence from a workshop, and the other one is the researcher's report in various forms as described below.

Workshop evidence

- **Tools** to support the future workshop technique (like proformas, worksheets, or templates) are produced to gather evidence in the action research project for further reflection and analysis of the improvement practice in order to produce a narrative account of what happens in practice. These proformas enable participants to make their own records and to build a portfolio of evidence about the tool improvement process, so participants can triangulate evidence of different kinds of improvement from different groups, enabling them to interrogate, exchange and discuss evidence with each other about the improvement practice. For the researchers, completed tools are **physical artefacts** (Yin, 2018) that contain written records such as notes made in the tools, drawings, words, diagrams, etc.
- **Audio records** were taken from the discussion of the improvement proposals at the implementation phase. This involved capturing learning about the predicted impacts of each set of proposals in their engagement process.
- **Photographs** were taken to document the process, record interesting events, and support other evidence gathered in this research project.

Personal accounts

- Reports, memos, diagrams (e.g. Appendix M), and blog posts of each case study are recorded to facilitate reflectivity in and on the practice of improving tools. Reflective blogs help to summarise learnings and to analyse and make sense of the evidence gathered in each workshop. If the workshop is delivered as a team and co-facilitated with another researcher, a debrief meeting after the workshop helps to discuss any project issues and feedback on what went well and what did not. Emails, notes from informal conversations before, after and/or during an event helped to make sense of what happened in the workshop. The content of these documents includes anything that helped to understand this new practice, as Jasper (2013, p.163) highlights: *'There are no rules about personal reflective writing – the important thing is to use it to achieve the purpose you are using it for, and to write in it in a way you want to write in it.'* Examples of such written records are presented in Appendices section of this thesis.

5.5.3 Analytic strategy

The analysis of the evidence follows a bricolage of general techniques (Yin, 2018) that **'play with data** in order to search for relevant patterns, insights, or concepts, **rely on the theoretical propositions** (Functionality, Instruction, and Flexibility), and that **work data from the ground up** in order to **develop a case description**. In this combination of techniques, various codes were assigned to evidence, and then examined, categorised, tabulated, tested and recombined with the assistance of the researcher's memos and diagrams in order to

draw empirical conclusions as a response to the ‘How’ research question of this thesis. In other words, the analysis begins with cross-case rather than a case analysis, where answers are grouped and analysed together instead of writing the case study for each event (Patton, 2015). This process forced the emergence an analytical framework that aims at covering the main research question that is divided into four levels of analysis presented as follows.

First analytical level: Coding and categorising participants’ actions within workshop activities

The evidence collected from each group of participants within cases was coded, examined, and categorised into features (title) and elements (example of coded quotations) of participants’ actions within each phase of the future workshop technique (**critique, fantasy, and implementation**) as shown in table 12.

Table 12. Workshop phases

Critique (Review/Examine)	Fantasy (Improve)	Implement (Learn)
Category Example of quotation Example of quotation	Category Example of quotation Example of quotation	Category Example of quotation Example of quotation
Category Example of quotation Example of quotation	Category Example of quotation Example of quotation	Category Example of quotation Example of quotation

Then, all categories are put into the improvement matrix to provide a big picture of the whole enquiry process in order to assist the visualisation and identification of patterns, similarities and differences across activities and cases, enabling the researcher to refine and recombine the categories as presented below.

Table 13. Improvement matrix for analysis of evidence

Dimensions Layer	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
Design Case 1	Challenge / Briefing Workshop phases (Table 12)	Interaction models Workshop phases (Table 12)	(Build) Resilience Workshop phases (Table 12)
Facilitation Case 2	Resources produced by facilitator Workshop phases (Table 12)	Facilitator notes Workshop phases (Table 12)	(Encourage) facilitator response Workshop phases (Table 12)
Application Case 3	Design of material Workshop phases (Table 12)	Example or use notes Workshop phases (Table 12)	(Enable) Contrary activity Workshop phases (Table 12)

Second analytical level: Analysis and interpretation across theoretical propositions (Functionality, instruction and flexibility) and cases

Considering the categories of improvement actions that emerged from the previous analysis, the researcher looks for patterns, similarities and differences across cases and improvement components in order to describe overlapping and supplementing actions and to empirically draw conclusions as exemplified in the figure below.

Dimensions Layer	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY
Design Case 2	Challenge / Brief Workshop phases (Table 6)	Interaction models Workshop phases (Table 6)	(Enable) Evidence ases
Facilitation Case 3	Facilitator Workshop phases (Table 6)	Facilitator Workshop phases (Table 6)	(Enable) Facilitator response Workshop phases (Table 6)
Application Case 1	Design of material Workshop phases (Table 6)	Example or use notes Workshop phases (Table 6)	(Enable) Contrary activity Workshop phases (Table 6)

Figure 5. Example of analysis and interpretation

Third analytical level: Answering protocol questions, and comparing and modifying improvement matrix

In the last analytical level, protocol questions are used as a case study ‘instrument’ (Yin, 2018) to orient the development of a ‘framework for reports or presentations that communicate the outcomes of this phase of research to relevant stakeholders’ (Stringer, 2007, p.103). The protocol is a set of questions that are posed to the researcher to keep track of the evidence and to reflect on the line of enquiry (Yin, 2018), i.e., the main research question: **How can knowledge exchange tools be improved?**

Three levels of questions are posed to complete the improvement matrix framework:

1. Questions verbalised to workshop participants
2. Questions about each case
3. Questions asked of the pattern of findings across multiple cases

Robert Yin (2018) highlights the difference between Level 1 and Level 2 questions as highly significant. In this research, this means that the questions of enquiry (Level 2) are not the same as the researcher emotes to participants in the workshop (Level 1). The researcher silently considers the predicted pattern (4.2) about each layer of KE design practice (Level 2), but the actual questions that the researcher poses to the participants (Level 1) do not directly reflect the researcher’s conjectures. Level 3 questions reflect on the line of enquiry and were not part of the evidence gathering as they can only be addressed after all the evidence has been examined. The Level 1 questions are presented in the following chapter, while Level 2 and 3 questions are presented in the framework for reports as follows.

Table 14. Improvement matrix framework for presentation

<p>Level 3 questions</p> <p>How do practitioners improve tools using the functionality dimension?</p> <p>How do practitioners improve tools using the instruction dimension?</p> <p>How do practitioners improve tools using the flexibility dimension?</p>	<p>Level 2 questions</p> <p>How do practitioners improve tools to develop the design layer of practice?</p> <p>How do practitioners improve tools to develop the facilitation layer of practice?</p> <p>How do practitioners improve tools to develop the application layer of practice?</p>	<table border="1"> <thead> <tr> <th style="font-size: small;">Layer</th> <th style="font-size: small;">FUNCTIONALITY</th> <th style="font-size: small;">INSTRUCTION</th> <th style="font-size: small;">FLEXIBILITY</th> </tr> </thead> <tbody> <tr> <td style="font-size: small;">Design</td> <td> <p>Level 1 question Challenge / Briefing</p> </td> <td> <p>Level 1 question Interaction models</p> </td> <td> <p>Level 1 question (Build) Resilience</p> </td> </tr> <tr> <td style="font-size: small;">Facilitation</td> <td> <p>Level 1 question Resources produced by facilitators</p> </td> <td> <p>Level 1 question Facilitator notes</p> </td> <td> <p>Level 1 question (Encourage) facilitator response</p> </td> </tr> <tr> <td style="font-size: small;">Application</td> <td> <p>Level 1 question Design of material</p> </td> <td> <p>Level 1 question Example or use notes</p> </td> <td> <p>Level 1 question (Enable) Contrary activity</p> </td> </tr> </tbody> </table>	Layer	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY	Design	<p>Level 1 question Challenge / Briefing</p>	<p>Level 1 question Interaction models</p>	<p>Level 1 question (Build) Resilience</p>	Facilitation	<p>Level 1 question Resources produced by facilitators</p>	<p>Level 1 question Facilitator notes</p>	<p>Level 1 question (Encourage) facilitator response</p>	Application	<p>Level 1 question Design of material</p>	<p>Level 1 question Example or use notes</p>	<p>Level 1 question (Enable) Contrary activity</p>
Layer	FUNCTIONALITY	INSTRUCTION	FLEXIBILITY															
Design	<p>Level 1 question Challenge / Briefing</p>	<p>Level 1 question Interaction models</p>	<p>Level 1 question (Build) Resilience</p>															
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Application	<p>Level 1 question Design of material</p>	<p>Level 1 question Example or use notes</p>	<p>Level 1 question (Enable) Contrary activity</p>															

With this framework, the researcher makes summaries of evidence through looking across dimensions and cases (cross-case synthesis) to answer the protocol questions and sometimes to lead to a *higher conceptual plane* (Yin, 2018), such as different types of empowerment in co-design (Zamenopoulos *et al.*, 2019). Once the framework is complete, it can be used for sharing and communicating the results to specific audiences. To build a more robust analysis, a fourth step is considered to enrich the analysis of the framework for reports.

Fourth analytical level: Pattern-matching for outcomes

In this multiple-case study, we tried to determine whether and how each group of participants could arrive at a consensus upon which improvement suggestions for a set of tools could lead to the development of their engagement practices in their organisation or community. The major proposition is that the three dimensions of tools (Instruction, Functionality, and Flexibility) can support the improvement of tools, developing the practice of knowledge exchange design in engagement practitioners, where a certain pattern of outcomes will occur. Once all the evidence is tabulated, a pattern matching technique is performed to compare the three predicted outcomes articulated in Sections 4.2.1., 4.2.2., and 4.2.3., and more clearly stated at the beginning of Chapter 7.

To develop a full description to communicate the results to the thesis committee and show the relationships among the case study and previous theory, the use of a pattern-matching logic can be used for comparing the empirically based pattern.

‘That is, one based on the findings from a case study – with a predicted one (or with several alternative predictions, including rivals) made before you collected your data. (...) If the empirical and predicted patterns appear to be similar, the results can help case studies to strengthen their internal validity’ (Yin, 2018, p.175).

More information can be incorporated that further clarifies or extends participants’ understanding (Stringer, 2007). This involves other relevant perspectives or research literature to achieve a holistic analysis that incorporates all factors likely to have an impact on achieving an effective solution to the improvement of tools.

5.5.4 Sharing and communicating the results

This stage focuses on composing, sharing and communicating the results and findings of case studies to three audiences:

- 1) Participants and other engagement practitioners interested in the practical outcomes of this research,
- 2) Experts in participatory design approaches and tools
- 3) Thesis committee.

For the first audience, the case studies are presented in a form of blog that tells the story of the workshop, the people involved, and the improved versions of tools as practical outcomes produced by and for the organisation or group of people involved in the process. For the second audience, the case studies are presented in two ways: (A) a simple and appealing graphic material to get feedback, insights, and solutions to improve the practicalities of the improvement matrix framework, and (B) conference presentations and workshops. For the third audience, a complete case study with the theories involved in the process, the methodological approach as shown in this chapter, and a thick description and conditions that this research project was carried out are presented in this thesis.

Each composition feeds into each other fluidly, providing evidence for the different stages of this action research project. The blog posts for external community produced after the delivery of workshops (1) assisted in the evidence analysis process as memos that were used for producing the graphic material for experts (2) as well as used for initial draft of complete case studies (3). The evidence used for sharing case studies to engagement practitioners (1) and experts (2), such as the evidence analysis, handouts and feedback, oriented the composition of final case studies, providing a writing structure composed of categories, quotes, ideas, implications and limitations of this study. The complete case studies and reflections on how the action research project was conducted are presented in Part B of this thesis. The following diagram illustrates the design research process that was conducted in each phase of this multiple-case study design, using the double diamond model.

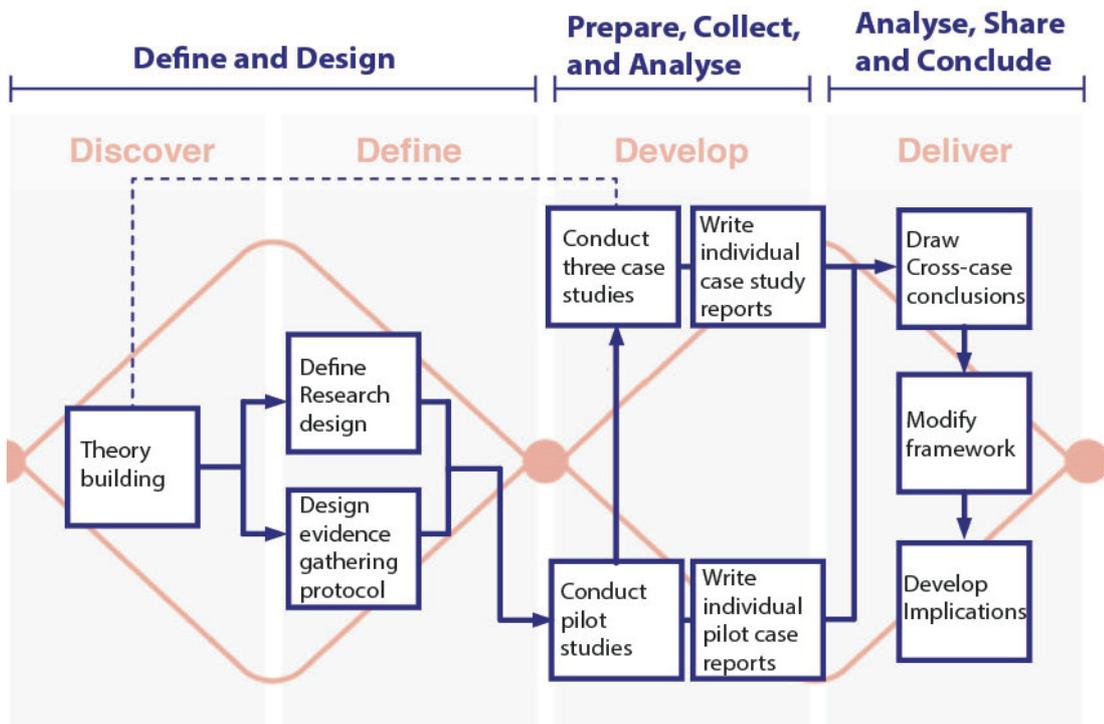


Figure 6. Multiple-case study design procedure

5.6 Chapter summary

This chapter introduced the research approach of this thesis (5.1), defining the term 'Research' and the practice-based research conducted through an action research methodology (5.2). Then, it discussed a review of research methods available to answer the research question in this thesis, exploring the advantages and disadvantages of each approach (5.3). This provided the rationale behind the research design (5.4) used to undertake this research project, where the case study theoretical framework is used to orient and integrate within the action research methodology. The last section (5.5) provides the research techniques employed for collecting and analysing evidence and communicating the results of this research project aimed at developing a framework for improving knowledge exchange tools.

This research design involves a systematic enquiry conducted through the practice of co-designing improvements, where a theoretical framework developed in Chapter 4 is tested in collaboration of engagement practitioners using co-design and PD methods, tenets, and guidelines. In PD, the future workshop technique is employed to assist in the investigation of the improvement practice, in which designed proformas and creative facilitation are employed to assist engagement practitioners to envision alternative futures about knowledge exchange tools. This research practice is oriented by CSR method, which provides a framework for gathering, analysing and reporting evidence, using replication logic in multiple-case studies, where each case is a workshop comprised of cycles of planning, acting, observing and reflecting. These procedures are presented in Section 5.5, where it describes the techniques used for conducting this research project, providing the strategies for ensuring rigour, collecting and analysing evidence, and reporting findings to different audiences.

**Part B – Pilot and case studies: Preparing,
developing, and sharing the Improvement
Matrix Framework**

6. Pilot case studies: Preparing for collecting evidence

In this PhD study, the researcher conducted two pilots between September and November 2017 as part of the action research project called Improve It. The researcher provided the participation information sheet (PIS) and consent form (Appendix 4) at the beginning of the study, and written informed consent was obtained from all participants of this study. This multiple-case pilot study aimed at supporting the research practice of delivering workshops as case studies, where the researcher prepared to collect evidence in a rigorous and systematic way. In this chapter, two pilot case studies describe the design and refinement of the case study research design as the workshop structure for evidence gathering and analysis used for testing the Improvement Matrix framework.

As presented in Section 5.4, the research design follows the action research methodology, where the action of co-designing improvements of tools that consists of a cycle of observing, suggesting changes and evaluating which changes lead to improvement is integrated into the action research cycle of planning, acting, observing and reflecting. Lessons learnt about the research design and the field procedure from each pilot case are presented at the end of each section. The following sections are structured using the action research cycle, where it describes the planning process, implementation of the plan, and the reflections and insights for the next workshops.

6.1 Pilot study 1: Designing the workshop structure

The objective of this pilot study was to test the workshop structure and facilitation with Lancaster University academics before delivering the workshop to external partners. The workshop focused on the improving the design of tools using the first layer of the improvement matrix (Table 15), where the researcher tested the three dimensions of the design layer of practice as shown below.

Table 15. Design layer

Layers \ Dimensions	FUNCTIONALITY	INSTRUCTIONS	FLEXIBILITY
DESIGN	Interaction models	Challenge / Briefing	(Build) Resilience

As discussed in Section 4.1, the design layer involves the creation of tools used in the planning of OD spaces, where designers have the ability to construct a specific design language (Ehn, 1988). Therefore, the researcher invited five members of the Leapfrog team and university academics with experience in designing and facilitating workshops, to assist in testing the workshop structure. They were invited through informal emails and conversations to a 1.5-hour pilot workshop, and attended the pilot workshop held at the ImaginationLab in September 2017.

Reflecting on the framework and the practice of facilitating this workshop as a whole contributed to the final workshop structure as well as to the first case study (Section 7.1),

where the design layer of practice was tested with the refined workshop structure. The workshop plan, process and insights are detailed in the following subsections.

6.1.1 Planning

The planning process involved considering improvement as a process of testing, responding and evaluating the workshop, rather than the evaluation of the tool that was improved in the process. The plan for the pilot workshop was composed of four phases: (I) introduction, (II) identification of issues, (III) co-design of improvements, (IV) evaluation and reflection. Each phase was designed based on a combination of two learning activities 'Carousel' and 'List and Share' (Chambers, 2002), where a group identified a list of problems and shared among the participants of the workshop, and then the workshop materials rotated at intervals instead of the groups moving to a different station. The rotation of materials sought to cross-check, qualify and correct the information generated (Chambers, 2002). The research plan and details of the plan are described below.

Table 16. Pilot workshop structure

Duration	Activity	Requirements & Breakdown
(I) INTRODUCTION		
8 min	Arrival & Coffee	Participants complete a consent form and sit at different stations
5 min	Introduction and tools	Present Leapfrog project introduction, objectives, and intentions of two tools
1 min	Workshop instructions	Participants choose one tool to work with, inform the process, provide materials and many copies of the tools, and instructions.
(II) IDENTIFICATION OF ISSUES		
8 min	Task 1	Draw out the function (Interaction models)
8 min	Task 2	Draw out the instruction (Briefing/Challenge)
8 min	Task 3	Draw out the flexibility (Build resilience)
5 min	Presentation	Present findings to the other group
Exchange workshop materials		
(III) CO-DESIGN OF IMPROVEMENTS		
8 min	Task 1	Improve the functionality (Interaction models)
8 min	Task 2	Improve the instruction (Briefing/Challenge)
8 min	Task 3	Improve the flexibility (Build resilience)
Exchange workshop materials		
(IV) EVALUATION AND REFLECTION		
2 min	Framework presentation	Present part of the improvement matrix framework and ask participants to rate the activities and share a few words express their thoughts and feelings.
9 min	Evaluate framework	Ask participants to respond to the evaluation forms
4 min	Discussion and feedback	Ask for other feedback?
	Wrap-up	Conclude workshop

(I) INTRODUCTION

In this phase, the researcher set the scene for the workshop, providing consent forms and introducing the topic of discussion to participants. The planned activities and duration in this phase are described as follows.

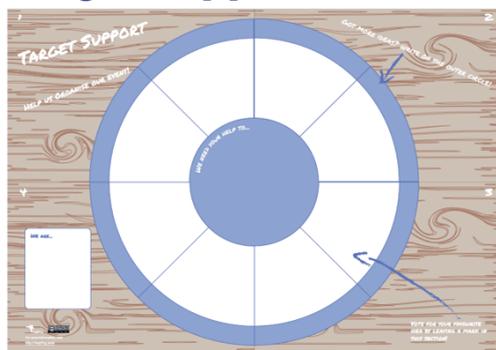
Contextualisation – The researcher gives a quick introduction to the Leapfrog project, and the tools co-designed in the project (Figure 7). Then, he presents the objective of the workshop to participants, which is to test and improve tools and provide feedback on the workshop structure.



Figure 7. Introduction slide of the project

Presentation of two tools – The researcher presents two tools co-designed in Leapfrog: Target Support and Plan B (Figure 8), and briefly describes them as a ‘tool to help people to discuss ideas’ (Target support) and ‘a tool to help people to generate alternative solutions’ (Plan B).

Target support



Plan B

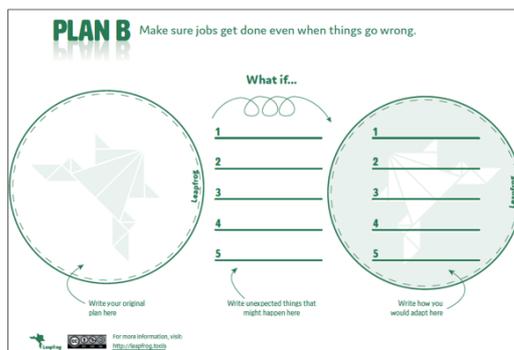


Figure 8. Target support and Plan B tools (see Appendix C for larger images)

Workshop instructions – The researcher asks each group of participants to choose one of the two tools to initially work with, and informs participants to look at the chosen tools in three different ways. Then, he provides materials (sharpies, scissors, tape), many copies of the tools to complete the tasks, and three proformas for the following phases, asking participants not to unfold or turn over the proformas (Figure 9).

(II) IDENTIFYING ISSUES AND MISUNDERSTANDINGS

In this phase, the researcher asks participants to draw out the issues in the tools they selected in the previous phase, using the proformas as a guide to take notes and to present their findings. The planned activities are described as follows.

Looking into the tool – The researcher asks participants to respond to questions proposed on the three proformas (Figure 9) by writing, creating visualisations, and drawing out the ideas of the tool they initially chose to work with.

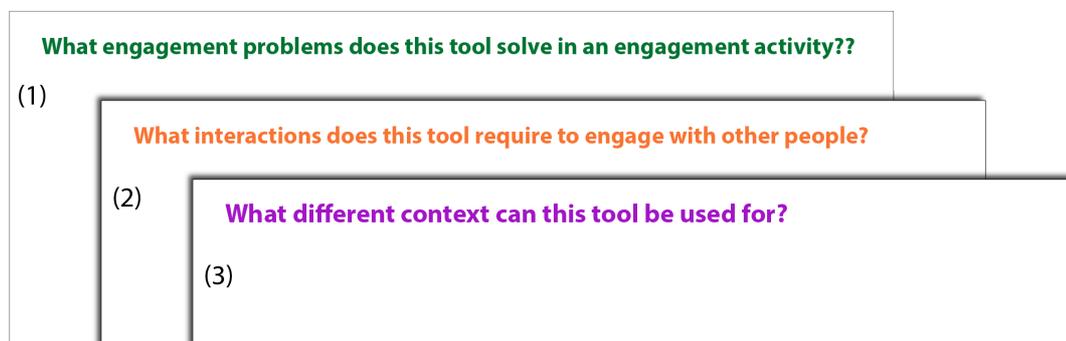


Figure 9. Workshop proformas with questions: (1) what interactions does this tool require to engage with other people? (2) What problem does this tool solve in an engagement activity? (3) what different context can this tool be used for?

Presenting issues – Once they finish examining the tool, each group summarise and present their findings to the other group.

(III) CO-DESIGNING OF IMPROVEMENTS

In this phase, the researcher asks participants to exchange tools and proformas with the other group and to co-design improvements based on the other group's notes and presentation. The planned activities in this phase is described as follows.

Co-designing improvements – The researcher asks participants to exchange tools and proformas, unfold or turn over the proformas (Figure 10), and propose improvements to the tools based on the other group's presentation and written findings. This phase is designed to happen in three different moments as a response to the information provided by the other group.

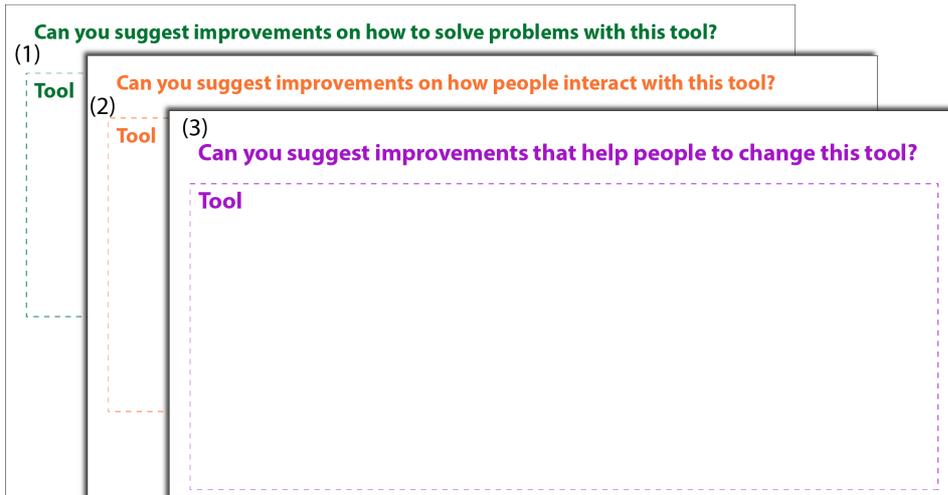


Figure 10. Unfolded workshop proformas with questions: (1) Can you suggest improvements on how people interact with this tool?, (2) Can you suggest improvements on how to solve problems with this tool?, (3) Can you suggest improvements that help people to change this tool?

Presenting improvements – Once they finish the improvement activity, each group summarises and presents their improvement ideas to the other group.

(IV) EVALUATION AND REFLECTION

In this phase, participants engage with the researcher’s theoretical framework to evaluate the workshop design and facilitation. The planned activities in this phase are described as follows.

Evaluation – The researcher presents part of the improvement matrix used for the design of the workshop (Figure 11) and asks participants to assess it using an evaluation sheet (Figure 12). Each evaluation sheet represents one of the three tasks associated with one of the improvement dimensions: Function, Instruction, and (Build) resilience.

Tool concept improvement

This workshop was designed to improve on the ideas behind a design of a tool.

<p style="color: #003366; font-size: small; margin: 0;">Function</p> <p style="color: #003366; font-weight: bold; margin: 0;">Model of interaction</p> <p style="color: #003366; font-size: small; margin: 5px 0;">This element describes which interactions a tool requires to engage with other people.</p> <p style="color: #003366; font-size: small; margin: 0;">It is about the intentions for which a tool was designed.</p>	<p style="color: #003366; font-size: small; margin: 0;">Instruction</p> <p style="color: #003366; font-weight: bold; margin: 0;">Challenge / Briefing</p> <p style="color: #003366; font-size: small; margin: 5px 0;">This element is related to the problems a tool solves in an engagement activity.</p> <p style="color: #003366; font-size: small; margin: 0;">The briefing is the essential information for the design of a tool.</p>	<p style="color: #003366; font-size: small; margin: 0;">Flexibility</p> <p style="color: #003366; font-weight: bold; margin: 0;">(Build) Resilience</p> <p style="color: #003366; font-size: small; margin: 5px 0;">This element is related to the features that allow a tool to be used in a different way.</p>
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Figure 11. Framework presentation slide

Figure 12. Evaluation sheets with questions: (1) How easy was it to understand the challenge? (2) How appropriate is this category? (3) How effective was improving this tool using this category?

Reflection – The researcher asks participants to present their thoughts and discuss the workshop in general. This discussion is recorded using a Dictaphone for further analysis.

6.1.2 Acting, observing and reflecting in practice

This section presents the implementation of the plan, describing the improvement activities as a basis for researcher’s reflection.

(I) INTRODUCTION

Even though the researcher presented that the objective of the workshop was to improve tools, and provide feedback to the workshop, the brief introduction was not enough to contextualise the activities that participants had to perform. The researcher presented the intentions of tools without the context in which it was developed, affecting the way participants responded to the following phases of the workshop.

(II) IDENTIFYING ISSUES AND MISUNDERSTANDINGS

This first phase of the workshop was not well understood by the participants. The lack of information about tools and the task made some of the participants confused during the activity. The researcher had to rephrase the task in different ways, so they could start working on the activity. Furthermore, the verbal instructions and questions on the proforma were not clear. The evidence is shown in the figure below, which presents notes with question marks such as 'what' and 'of whom', and 'function of tool not clear', showing their confusion over what they had to do. This might have happened due to the researcher's lack of understanding of his own framework. One participant who did not know what the tool was for, tried to understand the intention of it first before starting to respond to the tasks. This seemed to be an exploration of what the tool was capable of as the presentation in a brief introduction was not clear enough about the intentions which the tools were designed for. Some of the responses to the tasks relate to the workshop issues instead of tools, which was not the primary focus of the activity, as seen in the figure below.

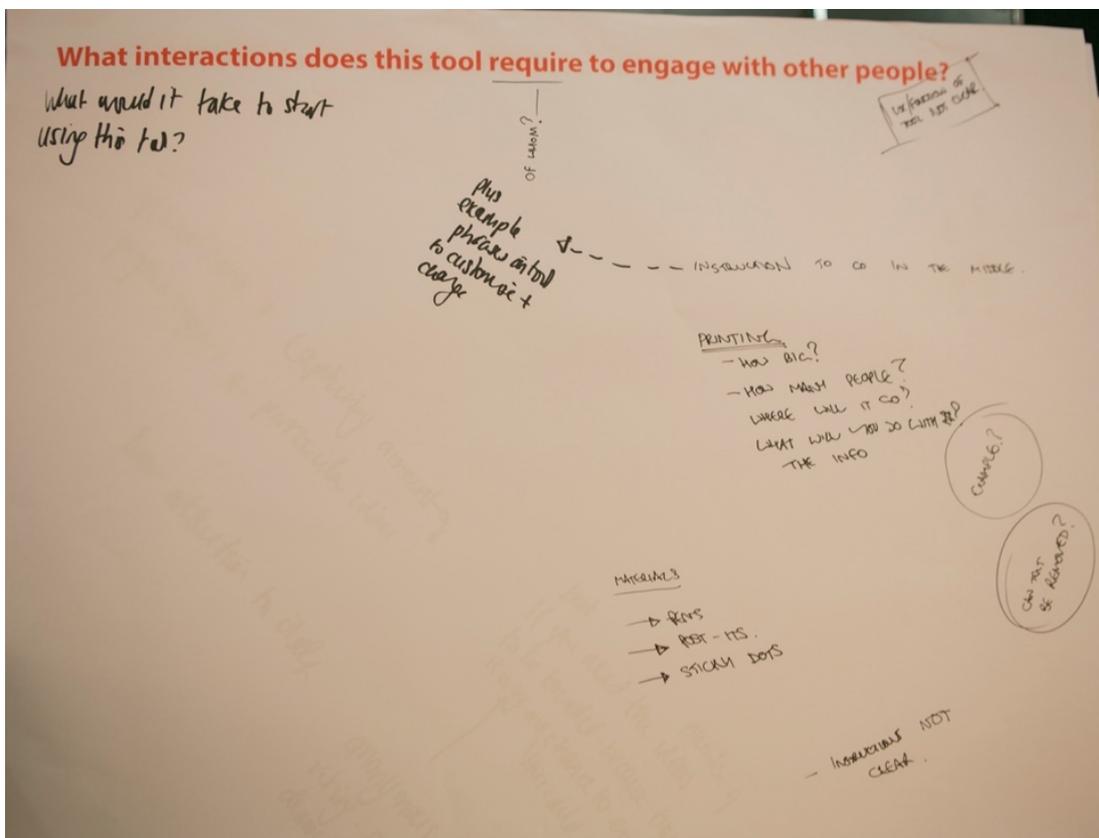


Figure 13. Identification of issues

Notes read:

'Function of tool not clear'

'What would it take to start using this tool?'

'require → of whom?'

'Instructions not clear'

Example?

Can that be removed?

(III) CO-DESIGNING IMPROVEMENTS

After the presentation of the group's findings, both groups exchanged the tool and proformas, and started to suggest improvements to the tools. The researcher planned this to

happen in three different steps, in a similar way that the first phase was planned. However, once all the tool issues were drawn out, participants did not follow the three tasks written on the proformas. Instead, participants proposed improvement suggestions to the tools, considering all group findings together as shown in Figure 14. One group tried to address the issues highlighted by the other group, while the other group did not consider the issues highlighted by the first group and reassessed the tool. The outcomes of this process would have been challenging to analyse, due to grouped responses related to three dimensions of tools in one proforma, which would make difficult to understand how tools are improved using each dimension.

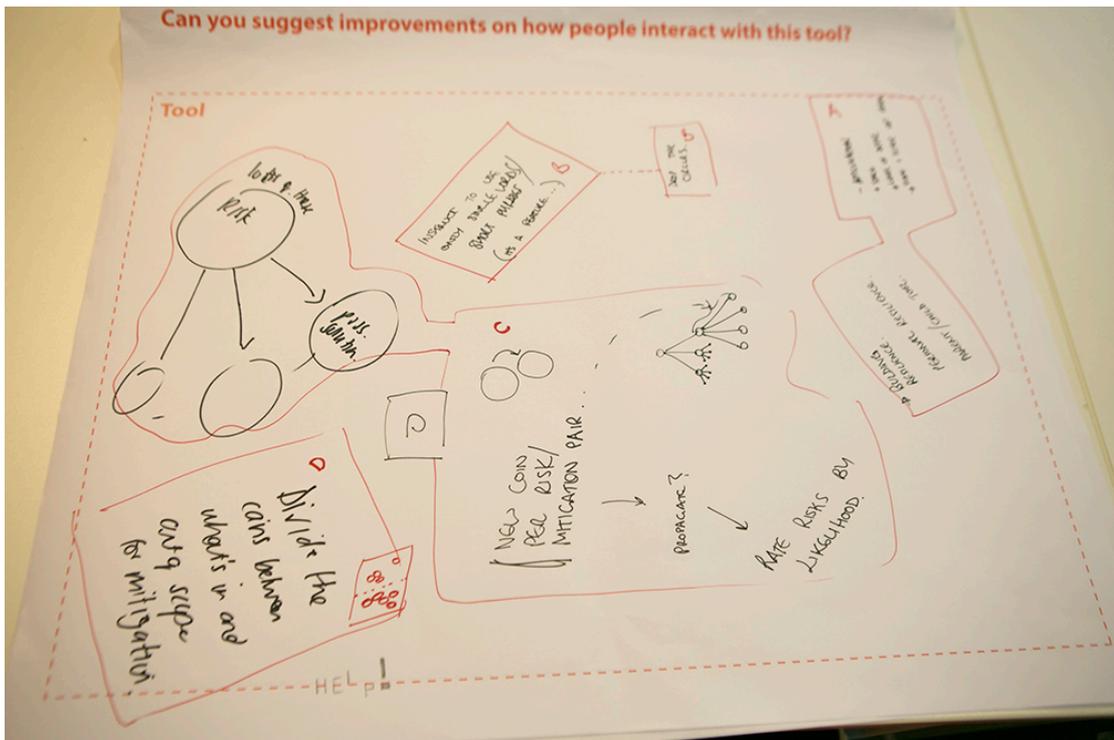


Figure 14. Many ideas for all identified issues in one proforma

(IV) EVALUATION AND REFLECTION

Participants struggled to respond to the evaluation sheet but provided feedback on the workshop. This activity overran the 15 minutes allocated for this phase, and lasted around 40-50 minutes in total. Participants could not understand what they had to do or evaluate in the workshop. After this phase, the researcher made a debrief with the co-investigator of the Leapfrog project. A series of issues were coded and categorised below:

- **Lack of clarity at the beginning of the workshop**
 - “When you begin the workshop, you need to be much clearer in explaining things to people. What are you doing, and why are you doing it.” (P2)
 - “It is completely unclear, what you mean, what you wanted. I just followed you and was enjoying the conversation, and it started to make sense to me. But, you’ve got say three or four people sat here, who have never seen this before, **don’t know what tools are**. They will just be like ‘What?’ So, you really think about your audience, you are going to this, what level of expertise and understanding they can have.” (P1)
 - You didn’t give us a lot of input in between the kind of structure, workshop have. You basically talk about teaching and learning in the workshop, and how you deliver it,

- you need to have a concrete structure of you are giving input, so we understand before this module is handed over to use.” (P4)*
- *“**You need to introduce to tools**, then you divide us into groups. Then you further look into these tools, and how this could be used. That input must be there, if that input isn’t there” (P4)*
- **Issues with the improvement process and suggestions on how to make it better**
 - *“Looking at this tool, if started off like: here is some leapfrog tools and I want you based on what you are seen in front of you, I want you to guess, from these choices, which of these little bits are what the tool is intended for. Is it (A) intended to catch mice in the field? Maybe if for testing intent to start with, and improving on that intend, maybe get people into that. Maybe that could be a way of starting that.” (P2)*
 - *“You can’t do that jump ‘challenge/brief’ bit, without an understanding of intent. **You either present the intent beforehand or a critique after use.**” (P3)*
 - *or maybe there is no right and wrong answer, and actually is about (P2)*
 - *“Tool are inherently messy, that’s fine. It’s okay to be messy, but within all that mess, there is an intent, and that’s you are trying to clarify and where the useful bits are, **you might have outlined information where people misunderstood the tool, but you actually are looking at the bit in the middle where people have got it, and use it usefully.**” (P3)*
 - *“But it also capitalising on this misunderstanding, and seen them as useful things, and generative by themselves.” (P2)*
 - **Language issues**
 - *“I think there are a couple of more issues, all the language in that, is too hard for general group, and you got think about the average language skills in this country is the readership of the sun. **If you are gonna target your language, you need to make it communicate clearly than the sun does. If you are. That’s mean a lot of simplification**” (P3)*
 - *“I write people’s research into documents that general public can understand. You will be surprised, **how is really simple you have to go to people to grasp things that you think is relatively simple.** Because I have no idea of any of this, all these tools. I don’t know what you want.” (P1)*
 - **There is no need for participants to engage with the theoretical model**
 - *“But you should be able to grasp it, that’s the thing. I think the problem of this workshop is that there were two levels: (A) the theory that you presented with, you got questions and misunderstands, that **I’m not grasping the subtilty in your theory**, but also it’s more confusing, because I always not understood exactly what you want us to do, in each exercise.” (P1)*
 - *“I think you are absolutely right. It might be that **you don’t need us as workshop participants to engage with your theoretical module**, so if this is the model you are building, and now you wanted to test through the workshops, that we don’t necessarily engage with this, head on, maybe there is a way a part where you can cut through it for us, that we still doing the things you wanted us to do, but we are not literally looking at your model.” (P2)*
 - *“I had absolutely no need to know your theoretical framework” (P3)*
 - **It was unclear what they had to evaluate**
 - *“Difficult to fill out the evaluation form, because I’m lost here. I don’t know what you want me to write on this.” (P1)*

- *"It's model by itself doesn't quite fit with the experience so far." (P2)*
- *"I had absolutely no need to know your theoretical framework, my concern should be: It's this thing gonna be a use to me? Did it perform well for me in my use? Can I offer a critique based on that? So no one will suffer the indignity? If I am in the real world, and I've being offered this? And I've been in the real world and being offered this kind of thing." (P2)*
- **(Debrief with Leapfrog co-investigator) The need of roles and scenarios: Insights on the design layer**
 - *"You were saying with people by people to solve their problem. I didn't know whether or not you meant the group, are we the people or are we in this workshop solving a problem or imagining we are practitioners, and we have to solve them, or we are imagining being a participant, are we solving a problem with the tool. It is an end-user problem, we have to design a new library?"*
 - *"Part of the reason the task was so hard. I didn't know what the tool would be for. **You could construct the scenario:** We are going to imagine, you guys are going to facilitate, you are going to work with young people, to figure out this."*
 - ***You might get people to construct their own scenario or agree,** or you might give them one. But, I think it's not clear what the word problem refers to, until you say. This would really help."*
 - *"Other thing is that plan B is designed for use of everyone equal, everyone is planning, whereas target support there is someone planning and facilitating. The tools are not equal in that respect. One is designed for people who don't care, the others is designed to help people who do care, that miss match. I'm not saying you need to change the tools. One is about to get feedback, the other is your team. **It's worthy to think about if they are equal.** If you did have the ontology, where you got 'here is a group of people planning the event', here is a group of people who are gonna to come, then you could clearly describe, where the tool fit."*

6.1.3 Insights and recommendations for next cycles

The researcher reflected on the workshop delivery and participants' feedback, providing insights to the redesign of the following workshops. These insights are summarised as follows:

- **Clarity: Language and wording**

Proformas and facilitation need be tailored to the audience. Questions and facilitation instructions provided to participants need to communicate clearly by using words and terms that the average individual can understand. As highlighted by Robert Yin (2018) and discussed in section 5.5.3, the researcher's questions of inquiry are not the same as the ones verbalised to participants, which require a more friendly, nonthreatening and unbiased question. Knowing how to ask and pose good questions and being a good listener are desired abilities to do a good case study.

- **Provide a more detailed introduction**

The facilitator needs to provide clear definition of goals, objectives of the workshop, and the definition of tools in order to direct the focus of the workshop. Participants need to be in the same mode when doing the improvement activities, where the researcher assists them to look at their own situation. The evidence gathered during all phases of the pilot workshop would have been very difficult to analyse. Providing examples on how to complete the proformas could guide participants to complete the tasks in a more organised way. These changes will enable community-based work in action research (Stringer, 2007), where people

develop their own analysis of their issues and courses of action, and the researcher stimulates them to improve their practice by addressing current issues that concern them.

- **More information about the tools**

Participants need to understand the intention of tools to be able to improve the design. Providing a more detailed scenario and context of use before the start of activities will reduce the time spent in understanding the function of the tool. Providing a set of tools and instructions together might help participants in the improvement process.

- **Improvement process**

Participants were asked to create a list of issues and misunderstandings looking into the three dimensions of tools (Function, Instruction and Flexibility), exchanged the materials with the other group, and then suggested improvements for each dimension based on the other group's list of issues. This improvement process did not work well and made outcomes difficult to analyse. Instead of identifying issues and suggesting improvements in three ways separately, these two steps can be combined. In this way, participants could focus on one dimension at a time, facilitating the evidence gathering process. The facilitator and proforma questions should ask participants to highlight which parts of the tool need to change and then improve them one after another, as doing it separately by different groups did not work as expected.

- **Evidence gathering and analysis**

The outcome of this workshop would not have been easy to analyse. The proformas used in the improvement tasks needed to provide clear questions, be redesigned and printed in a landscape orientation, so it would be easier to look across the tool before and after changes. Evaluation questions on the proformas should reflect on the concern of improving tools and not on the researcher's practice. This change would enable participants to collaboratively undertake each of the steps of the spiral of self-reflection by themselves (Kemmis *et al.*, 2014).

Building on these recommendations, a second pilot research was planned, where the researcher engaged with another group of practitioners in order to test another layer of practice within the Improvement Matrix framework. The researcher decided to start from the bottom layer of the framework, as he noticed that working on the design layer seemed to be more complicated to deliver, and the workshop structure needed to be refined. Therefore, the following workshop was redesigned to focus on the application layer of the matrix.

6.2 Pilot study 2: Refining the workshop structure

In this pilot study, the researcher worked in partnership with Lancashire County Council to collaboratively redesign some of the young people (YP) tools to improve their engagement practices. The management team of the Leaving Care Services was seeking to introduce changes, which could be supported through the use of tools to invigorate the pathway planning process of care leavers and support workers. They noticed the opportunity to change their practices through the implementation of the YP tools co-designed in the Leapfrog project. However, these tools were viewed as inappropriate for their work as care leavers are young adults aged 16-18. Considering this opportunity, the researcher invited the care leavers staff to improve YP tools to meet their requirements through a co-design workshop. Through informal meetings, attendance of events, online documents, and email

negotiations, the researcher familiarised with the organisation’s processes to design this improvement workshop.

The objective of this workshop was to test the dimensions of improvement within the application layer of practice of the Improvement Matrix in order to understand how engagement practitioners actually improve tools in practice. Building on the recommendations from the first pilot study, the order of tasks in the improvement process was changed, where the task about the instructions dimension was completed before the functionality one. The researcher asked participants to do three different activities (review the wording, explore the design of material, and suggest unexpected tool uses), and suggest improvements to tools without engaging with the theoretical framework. Each question was phrased in plain language that practitioners could understand, which corresponded to one component of the improvement matrix (Table 17). This approach is aligned with the protocol questions discussed in Section 5.5.3, where the question of inquiry is not the same as the ones posed to participants.

Table 17. Application layer of practice

Dimensions Layer	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
APPLICATION	Example or use notes	Design of material	(Enable) Contrary activity

The half-day workshop focused on improving the practical use of tools was delivered on the 27th of November 2018 at the ImaginationLab, where 10 care leaver support workers from North Lancashire attended the event. The focus of the session was to explore the inappropriateness of three YP tools and come up with ideas to improve these tools according to support workers’ practice. The researcher preselected three tools beforehand as potential resources to put care leavers’ voice in the centre of the decision-making planning about their adult life and independence. Although there was limited time for participants to reflect on the process and understand how the framework improved their own practice, this pilot was essential to establish the workshop structure used in the case studies of this thesis. The workshop structure, process and insights are detailed in the following subsections.

6.2.1 Planning

In this half-day workshop, the group of support workers came up with a set of proposals for improving Leapfrog tools in three different ways, and the workshop concluded with them presenting their suggestions to improve YP tools.

The arrangement for seating was designed to enable participants to easily move around during the workshop as the workshop structure required participants to change stations and do a rotation in order to provide a change in the participants’ mode by energising participants and making clear the change in the task and tool. Each station comprised a table with three to four chairs and workshop materials on it such as sharpies, post-it notes, masking tape and scissors, where the researcher handed out a proforma and a tool stuck on it for each group at the beginning of each round. Each **proforma is colour coded** to facilitate researcher and participants’ analysis and association in each activity. The carousel approach

in participatory workshops (Chambers, 2002) enabled active learning by moving participants to different stations where they explored other tools available in the workshop. The workshop consisted in an introduction, three rounds of co-designing improvements, and a phase of evaluation and reflection similar to the future workshop technique used in PD (Kensing and Madsen, 1992) as previously discussed in Section 5.3.5. Although the similarities in the process are visible, the researcher was not aware of the terminology used in the future workshop technique (Critique, Fantasy and Implementation) at this stage of his PhD. Therefore, this section will present the workshop plan in using the following headings: [INTRODUCTION], [ROUND I], [ROUND II], [ROUND III], [EVALUATING AND REFLECTING].

Each round consisted of identifying tool issues, highlighting findings and suggesting improvements based on one dimension of tools in the application layer. The evaluation and reflection phase has the purpose of helping participants to learn, share and consolidate researchers' and participants' learning (Chambers, 2002). This phase involved looking across the improvement suggestions and discussing whether the suggestions actually lead to improvements in their practice, using a visual scoring to evaluate how useful each dimension of tools was. The research plan and details of the plan are described below.

Table 18. Pilot workshop plan

Duration	Activity	Requirements & Breakdown
INTRODUCTION		
15 min	Arrival & Coffee	Participants complete a consent form, name badge, Intro Card tool, and sit at different stations.
5 min	Intro Card activity	See description below
15 min	Introduction and tools presentation	Present Leapfrog project, definition of tool, workshop objective, the intention of three YP tools, and workshop agenda and instructions.
ROUND I. Improving instructions		
15 min	Identify issues	Participants review words on the tools
10 min	Co-design improvements	Participants suggest improvements to the wording
CHANGE STATIONS		
ROUND II. Improving functionality		
15 min	Identify issues	Participants explore the design of material
10 min	Co-design improvements	Participants suggest improvements to design of material
10 minutes break – CHANGE STATIONS		
ROUND III. Improving flexibility		
15 min	Test flexibility	Participants explore unexpected uses
10 min	Co-design improvements	Participants suggest improvements to enable contrary activities
RETURN TO THE INITIAL STATION		
OBSERVING AND REFLECTING – Testing ideas and learning from the test		
25 min	Evaluate and reflect	Participants look across all improvement suggestions for the tools, rate suggestions, and share their findings.
5 min	Feedback	Ask for other feedback?
	Wrap-up	Conclude workshop

INTRODUCTION

Intro card activity – The Intro Card tool is used for introductions in a fun and collaborative activity, where participants have to describe themselves using 5 words and by drawing 5 lines and articulate this information to the group in 5 seconds. As most of them did not know each other, this activity was used for engaging participants and warming them up for the next activities by getting them moving and expressing themselves at the beginning of the workshop.

Contextualisation – The researcher presents the Leapfrog project, the definition of tools, and the tools that were co-designed with young people and engagement practitioners who work with YP on a day-to-day basis. The researcher defines tools as adaptable resources that help people to have creative conversations in order to achieve a desired objective, where they can be used in many different ways as any building tool. For instance, a spanner can be used for fixing a washing machine, to assemble a chair or install a sink. What gives meaning to the tool is the purpose, context and people involved in the process. Then, the researcher highlights the objective of the session, which is to improve tools according to support workers' practice in order to better engage with young adults as the tools co-designed with YP were considered inappropriate for their practice (Figure 15).

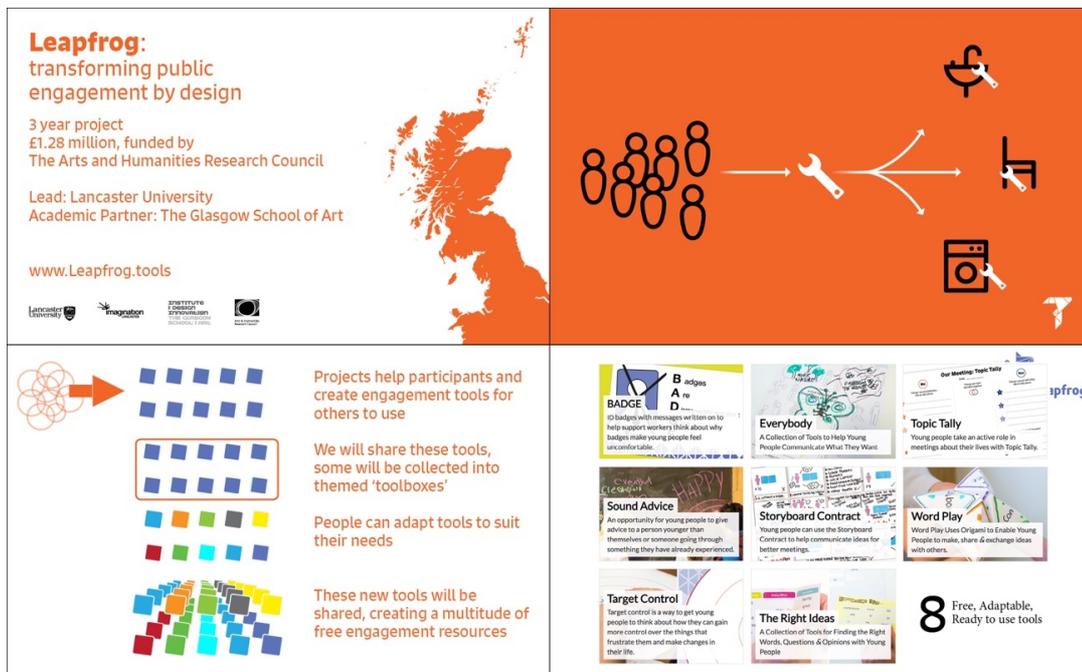


Figure 15. Introduction slides

Workshop instructions and tools – The researcher presents the workshops agenda (Figure 16) and instructions as follows:

- Consider own practice and processes in general when looking into the tools.
- Scribble and take notes on the tools without being scared of ruining them.
- Remind participants that groups should be able to understand other groups' handwriting/notes.
- Stay in the same group until the end of the workshop.

Workshop agenda

- 25 minutes: **Activity 1**
- 25 minutes: **Activity 2**
- 10 minutes break ---
- 25 minutes: **Activity 3**
- 20 minutes: **Re-evaluation**
- 5 minutes: **Feedback**
- Wrap up
- Lunch



Figure 16. Workshop agenda slide

Then, the researcher presents the intentions of the three tools, and examples on how they have been used for (Figure 17).



Everybody

Creates a negotiated order for topics to be discussed in meetings.

Storyboard contract

The tool acts as a way for young people to tell a story about how they feel about their meetings and explore ideas they have for how they could be made better.

Figure 17. Tools used in the workshop and examples of use. Tools: Everybody, Topic tally, Storyboard contract (see Appendix C for larger images)

ROUND I – Identifying issues and suggesting improvements to example or use notes of the tools

	INSTRUCTION	FUNCTION	FEASIBILITY
APPLICATION			

Looking into tools – The researcher asks participants to review the wording and highlight where they wish they could change, providing examples on how this activity could be done. The researcher also asks them to describe their findings on the folded proforma provided for this round as illustrated in Figure 18 below.

Suggesting improvements to the tools – The researcher asks participants to unfold the proforma and respond to the activity by giving suggestions to improve the issues and misunderstandings previously highlighted. Examples on how to respond to this task were also provided to participants. Once participants concluded this activity, they were asked to change tables and seats, and go to the next table in a clockwise direction. Making sure where the groups should go is important, as it is tricky to put things right again (Chambers, 2002).

Task 1

Review the wording and **highlight** the words you wish you could change

Example

Improve It

Can you **give suggestions to improve** the tool?

Example

- 1 Use ZFP slangs. For instance: *Reps* instead of *people*
- 2 Make it more visible. Use another icon to represent the task. It could be a pencil and an eraser instead of a scissor and pencil
- 3 Give examples on how to fill in the blank SPACE

Figure 18. Slides with examples on how to complete the task 1.

ROUND II – Identifying issues and suggesting improvements to the design of material

LEVEL	INSTRUCTION	FUNCTION	FLEXIBILITY
APPLICATION			

Looking into tools – The researcher asks participants to explore the design of material and highlight where they wish they could make changes, providing examples on how this activity could be done. The researcher also asks them to describe their findings on the folded proforma provided for this round as presented in Figure 19 below.

Suggesting improvements to the tools – The researcher asks participants to unfold the proforma and respond to the activity by giving suggestions to improve the issues and misunderstandings highlighted previously. Examples on how to respond to this task were also provided to participants. Once participants conclude this activity, there is a 10-minute break before the start of the last round. The researcher reminds participants to stay in the same group after the break.

Task 2

Use the tool and explore the design of material. Highlight where you wish you could change it

Example

Improve It

Can you **give suggestions to improve the tool?**

Example

Figure 19. Slides with examples on how to complete the task 2

ROUND III – Exploring unexpected use and suggesting improvements to support it

	RETRIEVAL	FUNCTION	USABILITY
SAFETY			
APPLICATION			

Looking into tools – The researcher asks participants to use the tool in a way it was not intended to be used and highlight where they wish they could make changes to support their practice, providing examples on how this activity could be done (Figure 20).

Suggesting improvements to the tools – The researcher asks participants to unfold the proforma and give suggestions to improve the issues, misunderstandings, and suggestions highlighted on the previous activity. Examples on how to respond to this task were also provided to participants. Once participants complete this round, the researcher asks them to come back to the table they initially started the workshop at.

Task 3

Use the tool in a way it was **not intended to be used**
Highlight where you wish you could change it

Example

Improve It

Example

Figure 20. Slides with examples on how to complete the task 3

EVALUATING AND REFLECTING – Testing ideas and learning from the test

Looking across all suggestions – The researcher asks participants to spread out all the completed proformas on the table, to look across all suggestions for the tool they initially started working with, and to decide where there have been improvements in the tool. He asks them to rate each set of proposals from 1 star to 5 on an evaluation sheet and share a few words to express their thoughts and feelings (Figure 21). Each set of proposals was rated according to each round as shown below. In this phase, the researcher asks participants how useful each of the proposals was for their practice.

Rate each set of proposals using stars out of 5, and if you like share a few words that express your thoughts and feelings further. Thank you!

Task 1 → Words ☆☆☆☆☆

Task 2 → Design of material ☆☆☆☆☆

Task 3 → Flexibility ☆☆☆☆☆

Figure 21. Pilot workshop 1 – Evaluation form

Presentation and discussion – The researcher asks each group to present what they learnt from the test and discuss with the whole group about the actions that lead to improvement.

Extra feedback on tools – The researcher prompts participants to share any other thoughts or feedback about the tools.

Contingency time and wrap-up – The researcher thanks participants, gives them postcards (Figure 22), and invites them to be part of Leapfrog Facebook group discussion.



Figure 22. Examples of leapfrog postcard

6.2.2 Acting, observing and reflecting in practice

This section presents the implementation of the plan, describing the improvement activities as a basis for the researcher’s reflection.

INTRODUCTION

Once participants accommodated themselves at the ImaginationLab, they introduced themselves using Intro Card tool (Figure 23) and chose a station to sit at. The researcher presented the project, definition of tools, and made clear that the objective of the workshop was aligned with care leavers’ concerns about improving their practice in supporting care leavers through tools. The researcher presented the tools, workshop instructions and agenda, and provided a space for participants to ask any question before starting the activities. During the workshop, participants were constantly reminded about considering their practice when examining the tools during each task, making sure the concern was shared among participants.

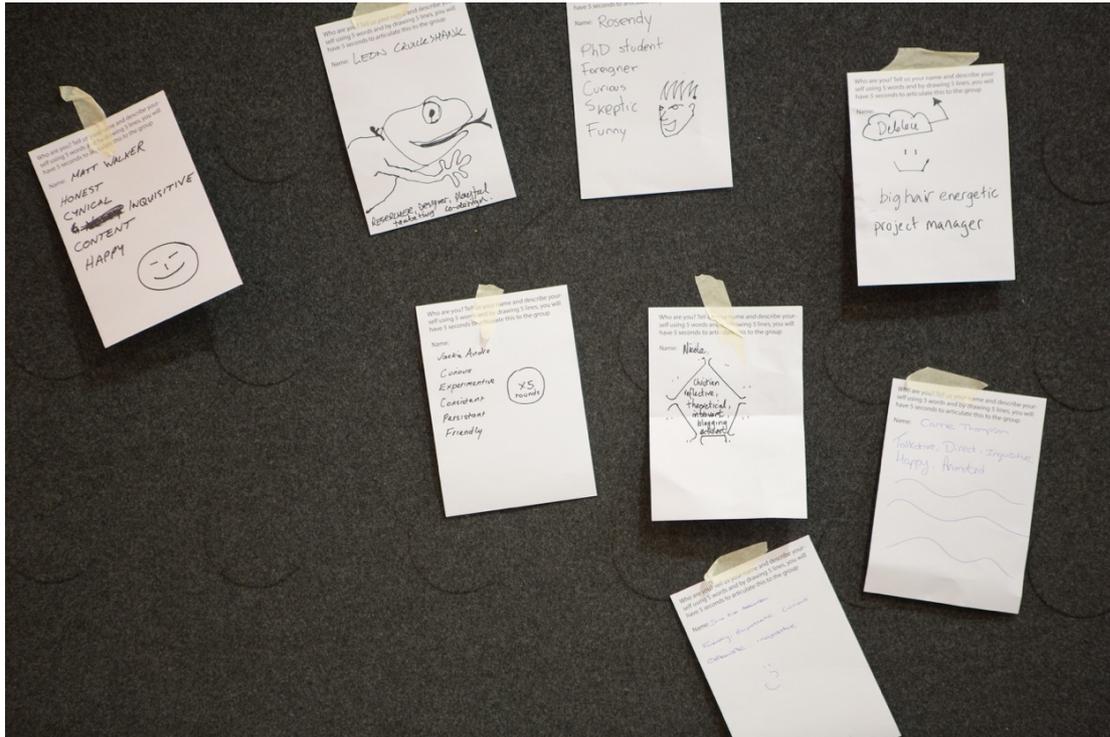


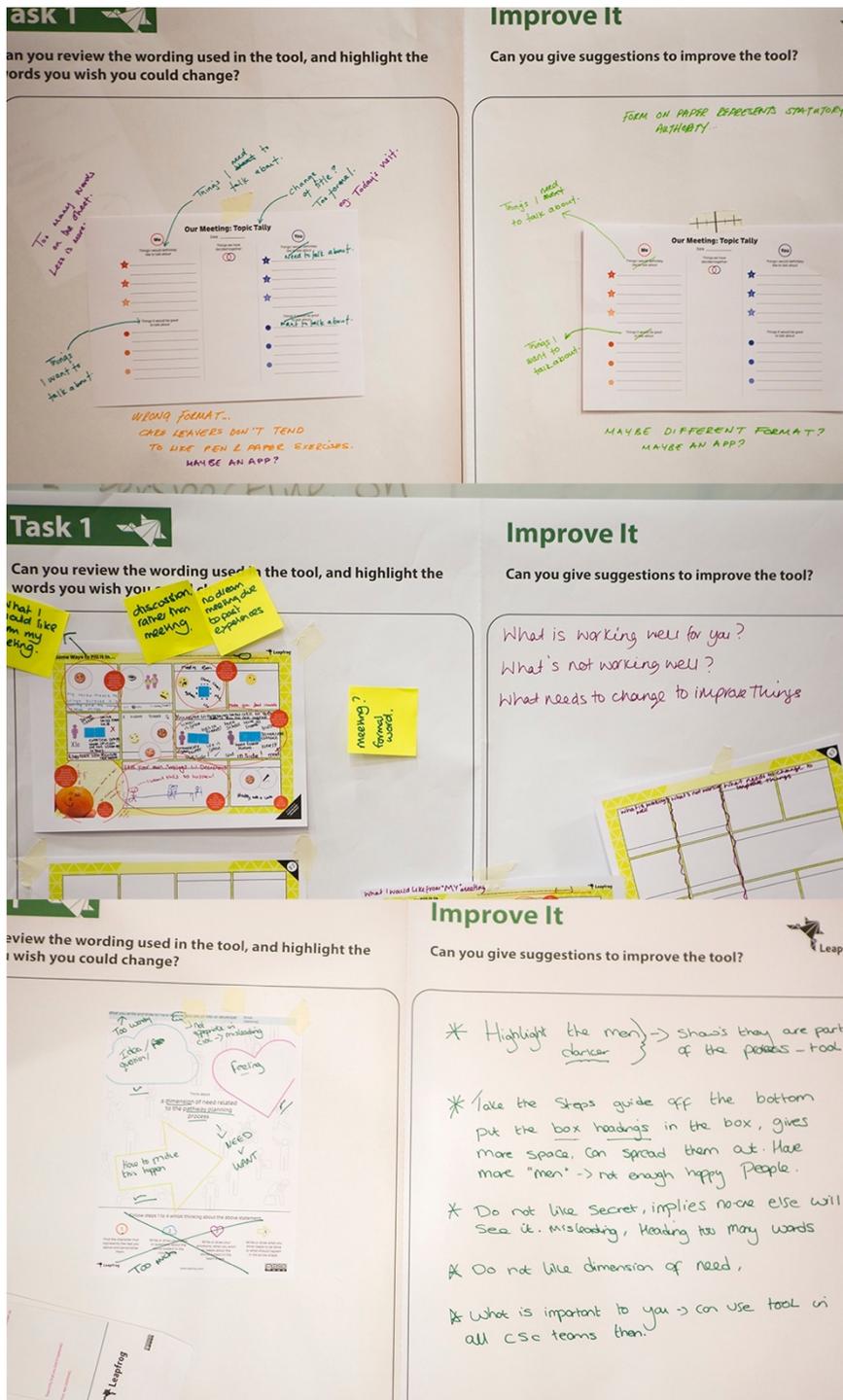
Figure 23. Intro Card tool (A5 paper size)¹⁷ – Question: Who are you? Tell us your name and describe yourself using 5 words and by drawing 5 lines, you will have 5 seconds to articulate this to the group.

ROUND I – Improving example or use notes

Each group of participants looked into wording of one of the three tools and evidenced the issues to their practice, and then suggested improvements. Looking at the words in the tool was a straightforward activity. However, one of the tools did not have many words to look at, making the group finish this activity in a few minutes. When participants were looking into wording, they were evidencing **the inappropriate wording** in the tool (the wordiness, and the words that could mislead care leavers or were too formal) or **additional or different (style) instructions**. Their suggestions to improve the tool involved **changing the language style from formal to informal, changing words that were inappropriate to care leavers, and eliminating the excess of words**, as shown below:

	INSTRUCTION	FUNCTION	FEASIBILITY
LEARN			
APPLICATION			

¹⁷ <http://impact.lancaster.ac.uk/tools/#/introcards>



Example of notes read:

[Wordiness] - Too many words

[Formal language] - Meeting? Formal word

[Misleading] - Secret → not appropriate in CIOC* (Children in our care*)

Examples of Improvement suggestions

[Remove words] - Less is more

[Change language style] - Discussion rather than meeting

[Change inappropriate words] - Do not like secret, implies no one else will see it.

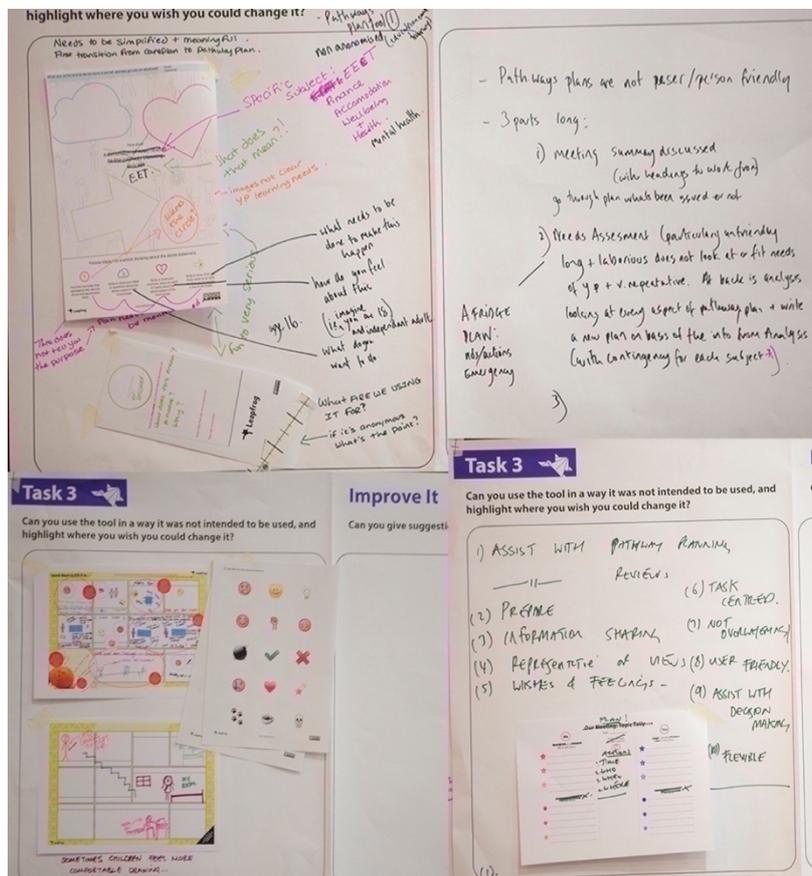
Figure 24. Participant responses to wording improvement task (See Appendices E and F for raw data and transcriptions)

ROUND II – Improving Design of Material

Once participants changed stations, each group of participants looked into the design of material of a second tool, evidencing the issues to their practice, and then suggested improvements. When participants were looking into design of material, they were evidencing **visual elements that were not appropriate** to the care leavers’ profile. They highlighted **communication issues** related to age, gender and level

	INSTRUCTION	FUNCTION	FEASIBILITY
APPLICATION			

a third tool, evidencing the issues to their practice, and then suggested improvements. When participants were looking into contrary activities with the tool, they were evidencing how rigid the pathway process was and how the tools needed to be simplified and made more meaningful to be useful in their practice. This involved making the tools more task-centred and person-friendly, requiring a more specific subject and heading to work with. Their responses are illustrated and grouped as follows.



Examples of notes read:

[Different uses]

- Needs to be simplified + meaningful
- Assist with pathway planning
- Meeting summary discussed (with headings to work from)
- Task centred
- User friendly
- Assist with decision making

Examples of Improvement suggestions

[Editable headings]

- Specific subject: Finance, accommodation, wellbeing + health
- Meeting summary discussed (with headings to work from)

Figure 26. Participant responses to contrary activity improvement task (See Appendices E and F for raw data and transcriptions)

[OBSERVING AND REFLECTING]

Due to the lack of time at the end of workshop, participants did not evaluate which suggestions led to improvements. The researcher asked participants to look across the proposals. However, they did not clearly understand how they had to do that. There were a few reasons that did not work in this process. One participant commented that it was difficult to evaluate something unfamiliar in a short period of time. Participants seemed confused on what to do, and the proformas were too big to be looked across on the table (Figure 27). The responses to these challenges are discussed in the following section (6.2.3).

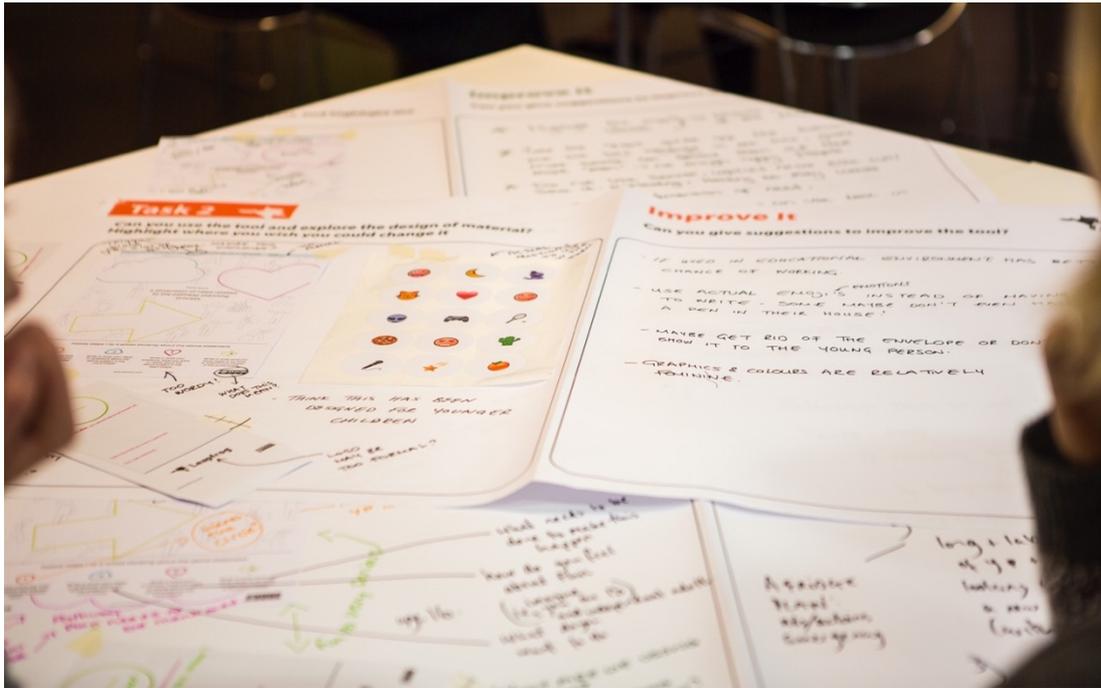


Figure 27. Proformas were too big to be laid out on the table

In this phase, the researcher improvised and asked each group of participants to present their own suggestions instead, while one person of the group summarised their findings on the evaluation sheet. Although, this workshop enabled the researcher to collect evidence on how tools are improved, the evaluation did not follow the initial plan used for ensuring rigour (5.5.1), where the group was supposed to reach an agreement on what suggestions might lead to improvements in their practice. However, the deviation from the planned evaluation enabled the researcher to collect evidence to elaborate preliminary ideas for the design of the framework of analysis as shown in the following paragraph.

Evaluation – Overall, participants filled in the evaluation sheet with less than 3 stars for each set of proposals (Figure 28), as the researcher believes that they were evaluating the actual tools which were not appropriate for their practice instead of the set of proposals suggested by other groups.

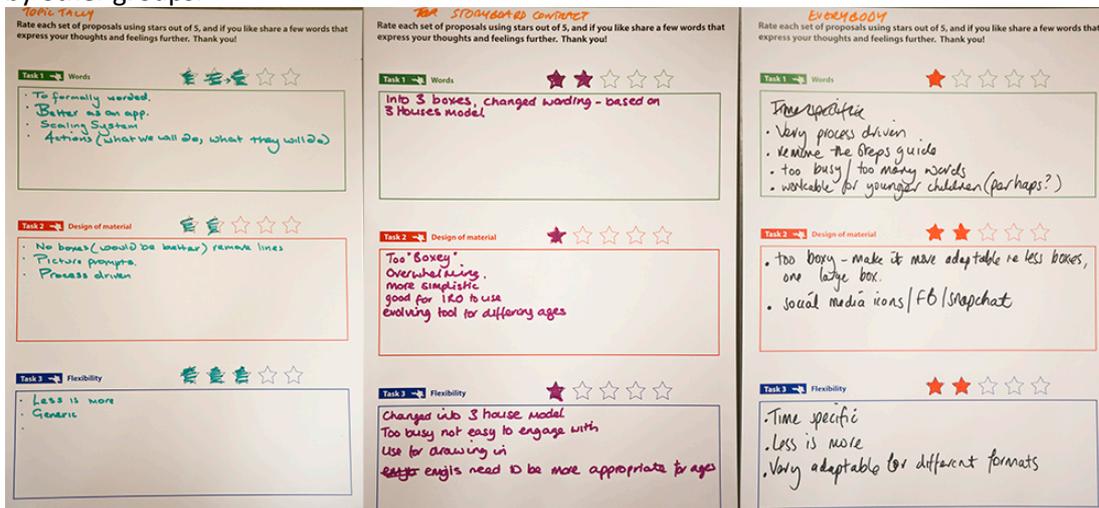


Figure 28. Participant responses to evaluation task (See Appendices E and F for raw data and transcriptions)

Notes read

Evaluation

Tool 1	Tool 2	Tool 3
Actions (What we will do, what they will do)	Into 3 boxes, changed wording – based on 3 houses model	Remove the steps guide Too busy / too many words
No boxes (would be better) remove lines	Too ‘boxey’	Too boxy – make it more adaptable ie less boxes, one large box
Less is more	Too busy not easy to engage with Use for drawing in	Less is more

Based on the summary above and the presentation of participants’ findings, some preliminary categories, which work with the research question of this thesis, involving the **type of communication** for different audiences were identified. The researcher collated codes related to the type of communication under two subcategories: **written and visual communication**. Another preliminary category identified was about making tools task-centred, removing unnecessary elements and providing specific questions / tasks. These categories were put into the improvement framework, as it was also used as an initial framework of analysis for this research presented as follows.

Table 19. Participants’ responses to the evaluation task (Words, Design of material, and Flexibility (See Appendices E and F for raw data and transcriptions)

Research question: How can tools for knowledge exchange be improved?		
Words	Design of material	Flexibility
Category: Written communication	Category: Visual communication	Category: Versatility
<p><u>Subcategory: Change communication style (Formal / Informal)</u></p> <p>- The sort as well, we sort of agree like ‘tally’ sounds like maths, and it should be our discussion.</p> <p>- We’ve changed the wording of it, so it’s not a meeting. It’s a discussion</p>	<p><u>Subcategory: Change visual design (Overwhelming / Simplistic)</u></p> <p>- I think we said it was too boxey, for young children it would be fine, like loads of boxes and it’s fun to talk about themselves, but teenagers don’t have the time, or won’t have time to try fill in 8 boxes, it’s overwhelming.</p> <p>- We’ve changed this one into a tool we use all the time houses. What is going on, because pictures and pics thousands of words for me that’s how I work, kids don’t always want to verbalise.</p>	<p><u>Subcategory: Make it generic / simple</u></p> <p>- Take out the steps guide in the bottom of the page, allowing to get more space</p> <p>- We felt like the graphics and colours are relatively feminine, and should be more sort of generic maybe androgynous looking form</p>

Although there was not a discussion about what actions lead to improvement, there were some agreements on the visual design and the amount of words, such as ‘less is more’ or ‘less boxy’.

6.2.3 Insights and recommendations for next workshops

After the workshop, the researcher reflected on the process to decide on the next actions. The main points raised at this session were:

- The researcher found out that support workers build up the relationships with care leavers through an informal conversation. The introduction of a tool in this 1-on-1 conversation would have created a barrier in the relationship between a care leaver and support worker. Although, some tools presented in the workshop could be used

in a different stage of support workers' practice, they were seen as too removed from their practice.

- There was a disconnect between the management team and support workers. Tools were imposed on support workers to improve their practice. However, this is against action research principles, in which there should be a shared concern between the people involved in the project. Therefore, the researcher decided to cancel other arranged workshops as the support workers were not appropriate participants for this research.

A list of other insights is presented below.

- **Remind participants about the workshop objective** – Working on the application layer of practice to improve tools is more straightforward than working on the design layer. Therefore, it does not require a scenario, as long as the facilitator reminds participants to consider their own practice during the workshop.
- **Type of tools** – If the tools contain more visual elements than written information, the time spent looking into the tool can be reduced or shortened.
- **Allow more time for reflection** – a longer time to reflect and evaluate the improvement proposals is required to decide which changes lead to improvement and determine the warranted actions. Robert Chambers (2002) recommends doubling the time for evaluation and reflection as this phase of evaluation is usually squeezed into the plan.
- **Proforma size** – The three proformas used for collecting evidence and describing the issues and improvements should all fit on the table, or be put on the floor, or stuck on the wall after the three rounds to allow participants to look across all three set of proposals.
- **Small groups** – Stringer (2007) recommends a group of no more than six members in an action research project and Kensing and Madsen (1992) recommends four or five people in a future workshop. However, a group of 4 people might be too much as participants might lose their focus in this improvement workshop (Figure 29).



Figure 29. Four people discussing the improvement of a tool

Building on these recommendations and reflection, the workshop structure was planned and adapted in the next workshops according to each group of participants and layer of the improvement matrix tested. The following chapter presents how the structure and insights gained from the pilot studies fed into planning the main workshop as case studies.

7. Case studies: Developing the Improvement Matrix

This chapter describes three case studies conducted between April and July 2018 that were conducted as part of the action research project called Improve It. The researcher provided the participation information sheet (PIS) and consent form (Appendix A and B) at the beginning of the study, and written informed consent was obtained from all participants. . Each case study represents a workshop, where a group of engagement practitioners tested a layer of practice of the improvement matrix using the three design propositions (**instructions**, **functionality** and **flexibility**) to redesign tools to develop their practices and extend the understanding of the framework as a dual outcome of this process. The material used for evidence gathering and case study reports use colour coding to facilitate researcher and participants' analysis and association with each activity as exemplified in this paragraph. Each case study was analysed and reported within an iterative process.

As discussed in Section 5.3, this action research thesis builds on current design research practice (Swann, 2002), where emancipatory participation and authentic collaboration of engagement practitioners in research are applied through the medium of participants' actions of design (Archer, 1995). The research design comprises three case studies, where the researcher delivered improvement workshops to engagement practitioners from different organisations and backgrounds to test the dimensions of tools in each layer of the improvement framework.

Building on the lessons learnt from pilot cases, each case study is reported through a similar action research structure, where it describes the **entry process (context), the planning process, the implementation of the plan, and the reflections, insights and discussion of findings**. Each section is presented using similar headings to pilot study 2: 'INTRODUCTION', 'ROUND I, II, III', 'EVALUATING AND REFLECTING', describing the small changes and details in the workshop plan and outcomes in each phase of the workshop.

Sections 7.1, 7.2 and 7.3 describe the process of improving tools as case studies, where engagement practitioners — as active agents of change interested in getting the benefits of improved tools — experimented, learnt and reflected on the process of improving existing tools and their practices within small groups of 2 or 3 people. Each case study provided research evidence to compare how the findings match with the predicted patterns of results (Section 4.2.1., 4.2.2., and 4.2.3) as follows.

- **Design (Case study 1)** – The improvement of tools in the layer of practice will develop the KE practice of planning open design spaces (4.1.1), providing engagement practitioners new ideas to address their challenges at current and future engagement projects.
- **Facilitation (Case study 2)** – The improvement of tools in this layer of practice will develop the KE practice of enabling people to creatively exchange ideas and inputs in design processes (4.1.2), providing facilitators new ways to assist participants' understanding and contribution into engagement projects with their expertise.
- **Application (Case study 3)** - The improvement of tools in this layer of practice will develop and improve the practice of doing knowledge exchange through writing, making, and enacting activities in engagement projects by developing tools that are user-friendly to the individuals involved in an engagement project.

Section 7.4 presents a cross-case analysis and results, where it discusses how similar the three cases are, presenting the categories, quotes and description of the actions of improvement in each case, and how the three design propositions work. It concludes with the overall improvement matrix framework that summarises the case studies and findings.

The following image illustrates the structure of this chapter using the improvement matrix, which shows that the functionality and instructions dimensions are in a different order based on the pilot studies recommendations.

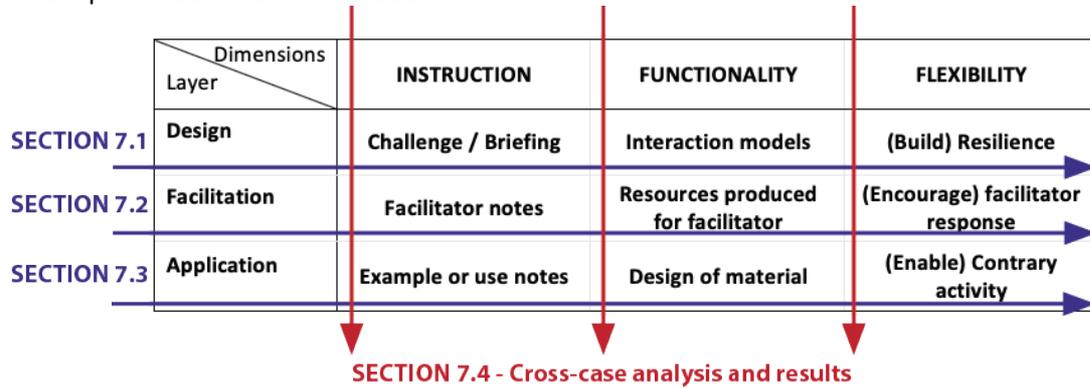


Figure 30. Overview of Chapter 7

7.1 Case study 1: Developing the improvement matrix through the design layer of practice

In this workshop, the researcher delivered a 1.5-hour workshop called ‘Improving Creative Engagement tools’ to eight DRS2018 delegates on the 25th of June 2017 at Limerick School of Art and Design (Figure 31). The researcher invited participants, who work with groups of non-designers or are experts in tools and participatory practices, to attend the workshop to improve their KE design practices.



Figure 31. 8 DRS2018 delegates at Limerick School of Art and Design

The researcher asked participants to do three different activities, where each activity corresponded to one component of the improvement matrix highlighted in Table 19 below. This workshop was a very challenging case study, as the researcher delivered the workshop in a shorter period of time compared to all the other cases. The plan and enactment of the plan are described in the following sections.

Table 20. Design layer

Layers \ Dimensions	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
Design	Challenge / Briefing	Interaction models	(Build) Resilience

7.1.1 Planning

In this 1.5-hour workshop, the group of DRS2018 delegates came up with a set of proposals for improving Leapfrog tools in three different ways, and concluded with them evaluating and presenting their suggestions. The seating arrangement was designed in the same way as previous workshops, where three stations with two to three chairs and one table were put together and close to each other, so participants could easily change stations at the end of each of the three rounds of improvements. The researcher included the intro card activity in the plan in a similar way that was planned in the pilot workshops. However, this activity did not happen due to the late start at the beginning of the workshop. The research plan and details are described below.

Table 21. Workshop 1 plan

Duration	Activity	Requirements & Breakdown
INTRODUCTION		
5 min	Intro card activity and consent term	Participants complete a consent form, name badge, and sit at different stations.
10 min	Introduction and tools presentation	Present Leapfrog project, definition of tool, neighbourhood major project, workshop objective, the intention of tools, and workshop instructions
ROUND I. Improving instructions		
8 min	Identify issues	Participants critique the instructions on how you address the challenge with the tools
7 min	Co-design improvements	Participants suggest improvements to the Briefing / Challenge
CHANGE STATIONS		
ROUND II. Improving functionality		
8 min	Identify issues	Participants explore the design concept of the tools
7 min	Co-design improvements	Participants suggest improvements to the interaction model of the tools
CHANGE STATIONS		
ROUND III. Improving flexibility		
8 min	Test flexibility	Participants explore unexpected applications for the tools
7 min	Co-design improvements	Participants suggest improvements to build resilience of the tool
RETURN TO THE INITIAL STATION		
EVALUATING AND REFLECTING		

25 min	Evaluate and reflect	Participants look across all improvement suggestions for the tools, rate suggestions, and share their findings.
3 min	Feedback	Ask for other feedback?
3 min	Wrap-up	Conclude workshop

INTRODUCTION

The researcher prioritised some information at the introduction phase, where Leapfrog, definition of tools, neighbourhood major project, workshop instructions and objective were presented, but the agenda was not included in the presentation slides. The researcher planned the introduction content to be presented in 15 minutes instead of the usual 30 minutes in order to squeeze all activities into 1.5 hours.

Workshop introduction, tools and challenges – The researcher introduced to practitioners the same challenges the Leapfrog partners had to face in the Leapfrog Major project 2 – Neighbourhood Centres (Leapfrog, 2017), in order to provide the context and intentions for which the tools presented at the workshop were designed. In this major project, Lancashire County Council (LCC) library practitioners worked in partnership with Leapfrog team as a result of a massive budget cut in Lancashire libraries and museums in November 2015¹⁸, which led the libraries to turn into neighbourhood centres. The main challenge of this project was to create a set of tools to enable the best possible transition to Neighbourhood Centres, i.e., tools that help each centre to address challenges in their own way (Figure 32).



Figure 32. Presentation slides: Major project 2 – Neighbourhood Centres

In the neighbourhood centres project, the library practitioners framed four challenges through an initial scoping workshop (Figure 33), in which tools were co-designed to address these challenges. These four challenges were (Leapfrog, 2017, p.19):

¹⁸ <https://www.lep.co.uk/news/revealed-40-libraries-five-museums-and-two-adult-education-centres-among-massive-cuts-announced-by-lancashire-county-council-1-7574160> [accessed 18 November 2015]



Figure 33. Presentation slides: Major project scoping workshop

- **Neighbourhood Centre Model – A Consistent Approach**

To find a way to deliver a consistent level of service in neighbourhood centres across the county, despite each centre being tailored to each community’s specific needs. To take advantage of greater collaboration between services to become more integrated, one community hub, and share expertise and facilities to become a more flexible resource.

- **Understanding Building Use and Resources**

Create an adaptable method, which enables decisions to be made on how services are to live together, enabling heads of services to know what is required to facilitate this. A toolkit with different topics will be created to share the day-to-day decision-making with regards to the use of the building i.e. Storage space, kitchen protocol. Creative ways of problem solving.

- **How to Engage the Whole Community**

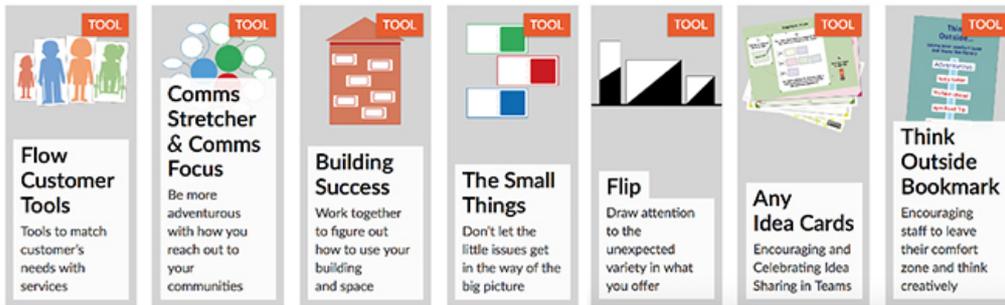
Provide a TWO-WAY communication toolkit to engage with a local community in order to understand the demographic breakdown of the communities and identify the different groups within it. Explore a variety of communication channels and use the most appropriate ones to reach each section. Inform communities what the new Neighbourhood centre has to offer and how they can access it. Set up processes to get community feedback and involvement to engage with the service.

- **Marketing and Communication (Internal & External)**

Create a common identity for all Neighbourhood Centres and identify different ways of communicating with a cross-section of service users and staff. Give staff and volunteers a sense of ownership of the building by being part of the change/transformation. Provide a communication toolkit that can be flexible and useful to various centres and demographics. Provide an opportunity for the community to get to know their Neighbourhood Centre. INNOVATIVE- Ways of communicating, use of space, ways of collaborating with other teams.

Based on these challenges, the Leapfrog team conducted a series of workshops with small groups of library engagement practitioners, where they co-designed 7 tools to address each of these challenges (Figure 34). In this first case study, the researcher preselected three of these tools (Figure 35) and presented to participants the three challenges that library practitioners had to design tools to address these challenges (Neighbourhood Centre Model, Understanding Building Use and Resources, How to Engage the Whole Community). The objective of this workshop was to critique and redesign the three tools to address the same challenges according to participants’ design practice.

Toolbox: New Team Tools



<http://leapfrog.tools/toolbox/new-team-tools/>



Figure 34. Co-designed tools



Figure 35. Tools presentation slides. Tools: Flow customer tools, Building Success, and Comms Stretcher & Focus (see Appendix C for larger images)

ROUND I, II, III – Critiquing tools and suggesting improvements

	INSTRUCTION	FUNCTION	FEASIBILITY
DESIGN			

These phases follow similar instructions as in Pilot study 2 (6.2). The researcher asks participants to critique the tools and suggest improvements, posing a question related to one component of the design layer in each round, providing examples on how to complete the task (Figure 36). Once participants finish the task, they move to the next station to do the succeeding rounds until they come back to their initial station for the evaluation and reflection phase.

Task 1

Can you **critique the instructions** on how you **address the challenge with the tool**? **Highlight** where you wish you could change it.

Example

Improve it

Can you **reimagine the instructions** and **give suggestions** to improve it?

Example

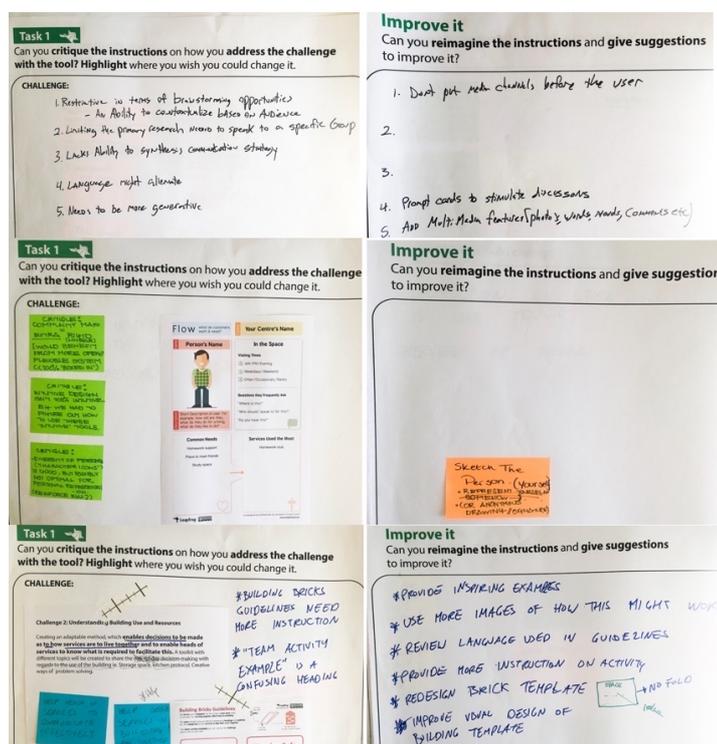
Figure 36. Examples on how to complete the task 1 – critique and reimagine the instructions.

The information provided appeared to be enough for the workshop activities, as the participants managed to critique and improve tools according to their practice, providing evidence to develop part of the design layer of practice in the improvement matrix as described as follows.

ROUND I. Improving challenge / briefing

Each group of participants critiqued the tools, considering how each was designed to address the challenge and briefing of the project, and then they reimagined the instructions, providing suggestions to improve the tool. Participants evidenced the **restrictions in the use of the tool**, and the **lack of clarity** in the language and instructions of use, and their improvement suggestions involved **providing additional features** to enhance group dynamics, and **more examples and instructions** on how a tool might work as shown below.

	INSTRUCTION	FUNCTION	FEASIBILITY
DESIGN			



Example of notes read:

[Restrictive aspects]

- Needs to be more generative
- Limiting the primary research needed to speak of a specific group
- Restrictive in terms of brainstorming opportunities / An ability to contextualize based on Audience
- Community map = Extra rigid (linear)

[lack of clarity]

Need more instructions

- Isn't 100% intuitive
- Building bricks guidelines need more instruction

Language issues

- Language might alienate
- 'Team activity example' is a confusing heading

Figure 38. Participant responses to the challenge / briefing improvement task (See Appendices G and H for raw data and transcriptions)

Examples of suggestions to improve instructions

[Provide more instructions – prime exercises]

- Provide inspiring examples
- Use more images of how this might work
- Provide more instruction on activity

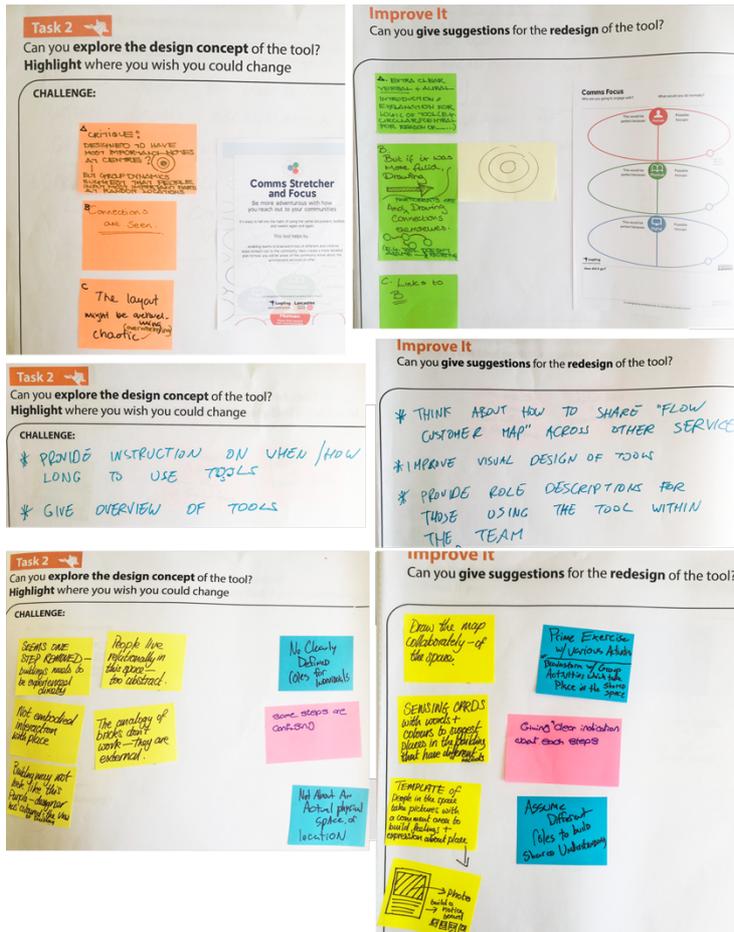
[Additional flexible or stimulating features]

- Prompt cards to stimulate discussions
- Add Multimedia features (photos, moods, coments etc)
- Redesign brick template
- Would benefit from more open // flexible system
- Sketch The Person (yourself)
- Represent yourself somehow (or anonymous drawing)

ROUND II. Improving interaction models

Once participants changed stations and tools, each group of participants critiqued the design concept of a second tool, evidencing the issues to their practice, and then suggested improvements for the redesign of the tools. When participants were looking into the design concept, they were evidencing the **unrealistic, impractical or inappropriate design concepts**, and the **lack of clarity** in the tool. Their suggestions involved providing **changes in the graphic design, additional instructions** to enhance shared understanding as shown below.

	INSTRUCTION	FUNCTION	FLEXIBILITY
DESIGN			



Example of notes read:

- [Inappropriate design concepts]**
- The analogy of bricks don't work – They are external
 - Building may not look like this Purple – designer has coloured the view of building
 - The layout might be overwhelming chaotic
 - Seems one step removed – Buildings need to be experienced directly
 - Design to have most important notes at centre? But group dynamics suggest that people input most important parts at random locations
 - People live relationally in this space – Too abstract

- [Lack of clarity]**
- Give overview of tools
 - Some steps are confusing
 - Provide instruction on when/how long to use tools
 - No clearly defined roles for individuals

Figure 39. Participant responses to the interaction model improvement task (See Appendices G and H for raw data and transcriptions)

Examples of suggestions to improve functionality

[Add resources or change the type of interactions]

- Draw the map collaboratively – of the space
- Think about how to share 'flow customer map' across other services
- TEMPLATE of people in the space
- Take picture with a comment area to build feelings + expression about place
- And participants are drawing connections themselves

[Provide more instructions / prime exercises]

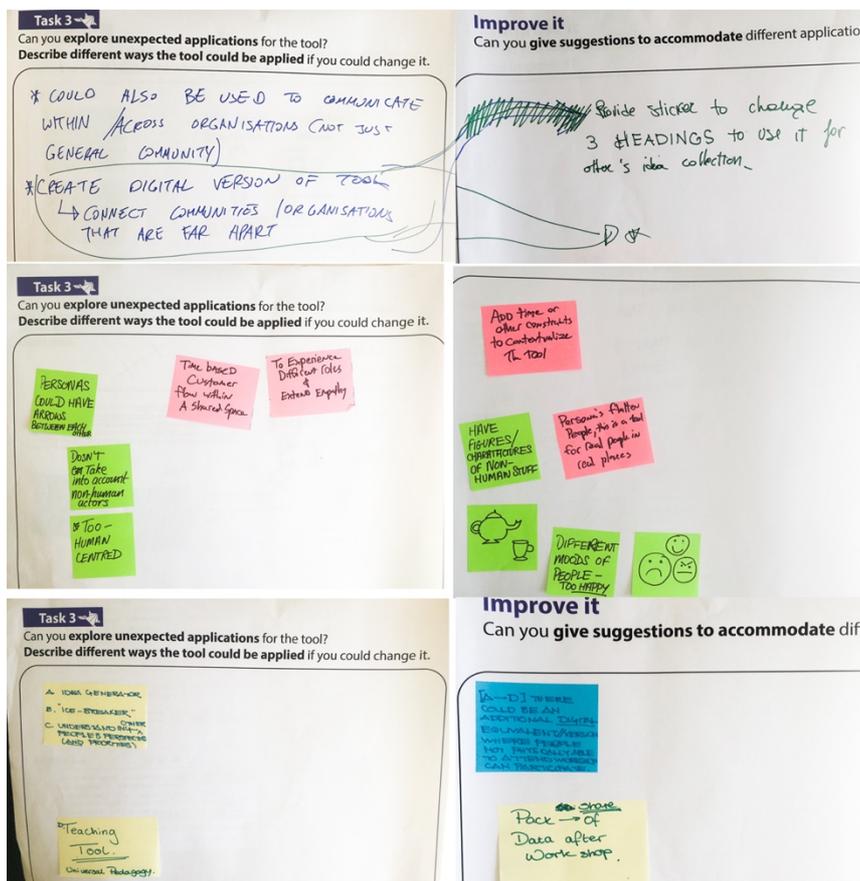
- Giving a clear indication about each step
- Extra clear verbal + Oral introduction // explanation for tools (E.g. Circular // Central for reason of)
- Assume different roles to build shared understanding
- Prime exercise w/ various activities
- Or Brainstorm w/group

ROUND III. Improving (Build) resilience

In this round, each group explored unexpected applications for the tools, evidencing the limitations and possibilities of each tool, and then suggested improvements to accommodate different applications.

When participants were looking into contrary activities with the tool, they were evidencing the **restrictions** to unexpected uses, and examples of applications. Their improvement suggestions involved **extending features**, **providing editable headings**, and **providing more instructions** to contextualise the tools.

LEVEL	INSTRUCTION	FUNCTION	RESILIENCY
DESIGN			



Example of notes read:

[Restrictive aspects]

- Doesn't take into account non-human actors / Too-human centred
- Time based customer flow within a shared space / to experience difficult roles and extend empathy
- Too happy
- Could also be used to communicate within / across organisations (not just general community)

Figure 40. Participant responses to the (build) resilience task (See Appendices G and H for raw data and transcriptions)

Examples of suggestions to improve flexibility

[Provide editable headings]

- Provide sticker to change 3 headings to use it for other's idea collection

[Provide more instructions]

- Add time or other constraints to contextualise the tool

[Extend features]

- Have figures / Caricatures of non-human stuff

- Different moods of people – Too happy

- Create digital version of tool

EVALUATION AND REFLECTION. Testing ideas and learning from the test

Once all the group of participants finished the last round, they moved back to their initial stations and tools. Firstly, they looked across all completed proformas about their initial tools and decided where there were improvements, and rated each set of proposals in each tool as illustrated in Figure 41. Secondly, they presented the learning from before and after

improvement proposals, and discussed with participants what suggestions led to improvements. The completed evaluation sheets and results of their reflections are presented and grouped under each of the three evaluated dimensions of improvement as follows. An additional heading about the overall process at the end of this section provides evidence of participants' learning and the effects of this research.

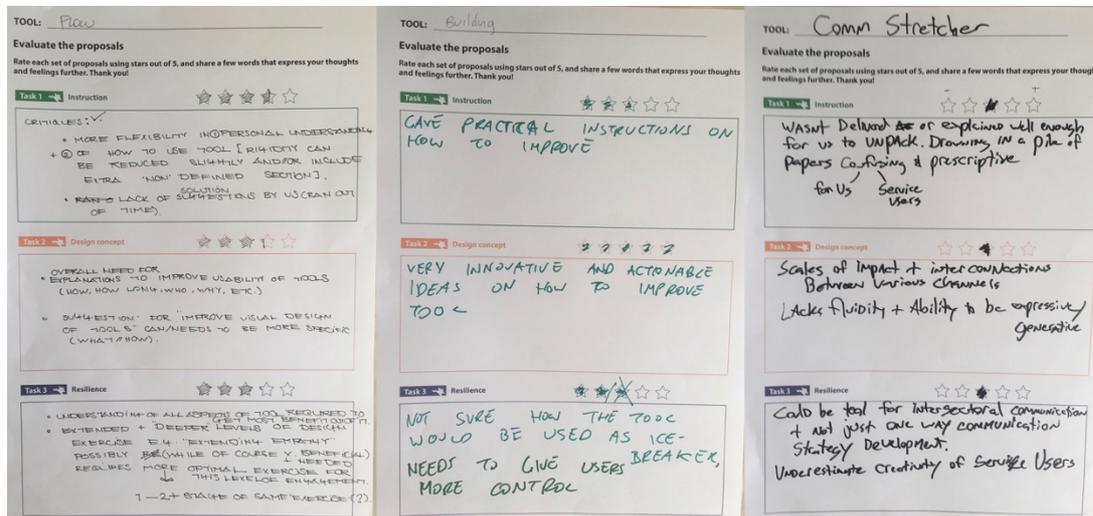


Figure 41. Participant responses to the evaluation task (See Appendices G and H for raw data and transcriptions)

Instructions

Overall, participants highly rated the suggestions to improve the instructions in this phase, providing a rationale for each proposal. In summary, improvements to instructions require **clearer design concept and instructions** and **more flexibility on personal understanding and how to use the tool**. Some comments on these improvements are evidenced as follows.

[Clear design concept and instructions]

- "so, when we first worked with instruction, it needs more of work and visual design, and instruction for users, and the concept here comes back to this steps, because of a lot of interesting things here"
- "Wasn't delivered or explained well enough for us to unpack. Drowning in a pile of papers confusing and prescriptive for us service users"

[More flexibility on personal understanding and how to use the tool]

- "More flexibility in (1) personal understanding + (2) of how to use tool [rigidity can be reduced slightly and//or include extra 'non' defined section"
- "Part of the critique was that I needed more flexibility on personal understanding of how the tool is used, or personal understanding of it, but specifically how this tool is used."
- "Prescriptive for us service users"

Design concept

When evaluating and reflecting on the improvements on the design concept, participants provided an overall rating similar to the instructions, and evidenced that improving this dimension involves **additional information to improve the usability of tools** and **new ideas to address a specific challenge**. Some comments on these improvements are evidenced as follows.

[Additional information to improve the usability of tools]

- *“Explanations to improve the usability of tools, like specific things like how, how long, who, why, etc. None of them were on the explanation sheets”*

[New ideas to address the challenge]

- *“it’s design-wise is intuitive, attractive or doesn’t really work, that you stick these and this, it does really make sense but there is really nice ideas about how to address that, like collaboratively making this map, I thought it is really a nice idea of the space, doing stuff like, in the actual space, having templates for people can a, have comment areas, make pictures like this, and they are really nice ideas, or there.”*

Resilience

When discussing improvements in resilience of the tool, participants provided an average rating to the proposals and evidenced **ideas to give practitioners more control and understanding** of a tool, and **expanding applications** would provide more flexibility to the tools as shown below.

[Provide ideas that give practitioners more control and flexibility in understanding]

- *“Underestimate creativity of service users”*
- *“Needs to give users more control. In terms of resilience, users having more control of the whole thing, as opposed of this template”*
- *“And people have their own ideas, why the colour is purple. So, I think you have to give more space, for people to think about the space.”*
- *“Understanding of all aspects of tool required to get most benefit out of it”*
- *“Extended + Deeper levels of design exercise. E.g. Extending empathy”*

[Expand applications]

- *Could be tool for intersectoral communication + not just one way communication strategy development*

Overall process

At the end of the workshop participants commented on the process:

Participants learnt how to use and improve tools through the process, but this learning could have been improved if more information at the beginning of the workshop were provided.

- *“Like some people feel like quite rigid, and like obviously the more people understand how to use the tool, and all the different aspects like the more you get out of this at the first place, sitting down at the end of task 3, I understand that if I’m working to figure task 1. Somehow we realised was after intuitive design had to be figured out, and therefore was intuitive despite the kind of graphic approach it has”*
- *“Accessibility that was very important. We felt that like it could have been further for that reason, if you started you guys exactly how to use it, even the term consent that we weren’t aware of, and where we invite for the start.”*
- *“Something we realised for each of us that there was a common theme that emerged in the understanding of how each of these tools were to be used”*

7.1.3 Reflections and insights

As a result of these workshops, the researcher designed improved versions of tools based on the evaluations and reflections from which participants' suggestions led to improvements as well as provided insights on the facilitating such workshops. The main insights raised at this workshop are:

- **Planning and managing the workshop content** – Unexpected events and time restriction were the main features in this workshop. Although participants struggled to understand the tools and activities at the beginning of the workshop, they managed to finish on time. One participant commented that the lack of accessibility in the workshop and the need to understand the graphic approach of the tools did not allow them to go one-step further in the process. Through an informal conversation with another participant after the workshop, he highlighted that the process was not clear at the beginning and presenting the workshop agenda was necessary. Getting settled before the start of the workshop, developing points in more detail, and providing a clearer focus at the beginning could have enhanced the impact of the workshop. Participants concluded activities on time at the expense of a better outcome.
- **Learning goes across different components** – the learning acquired from previous rounds becomes part of the process and is perceptible across the rounds. For example, improvement suggestions on the instructions and functionality of tools are seen on the three rounds of the workshop. There seems to be a natural tendency for participants to look at the functionality first, although they were initially guided to look at the instructions at the beginning.

7.1.4 Discussion of findings (within-case pattern analysis)

This section discusses the findings across design propositions (Instructions, functionality and flexibility) as a result of the second and fourth analytical level of the framework described in Section 5.5.3, providing the responses to questions about the case and the pattern-matching logic between the theoretical predictions (4.2.1) and the empirical outcomes from this case study (7.1.2) as follows.

The objective of this workshop was to understand how engagement practitioners improved tools in practice by creatively responding to tasks framed to test the three components of the improvement matrix across the design layer: **challenge / briefing, interaction model, and (build) resilience**. The findings from this workshop provided important insights on how these three components play out in practice, extending the understanding of the Improvement Matrix Framework. These findings and insights are described in the following paragraph.

In this case study, participants agreed upon a course of improvement for a set of tools by **providing more open and flexible design concepts that give KE designers more control over the engagement process, and also flexibility in using and understanding tools**. Participants' suggestions focused on extending features, providing more instructions, new ideas to address challenges in order to give more flexibility to practitioners. These types of improvements go across the three dimensions when they are used together to improve tools. In this sense, the design layer can be used to redesign tools to enable people to creatively apply tools in their practice by giving more control and understanding in their practice, following therefore, the definition of **good tools** discussed in Section 3.2.

A pattern-matching procedure, examining the predicted outcome (Section 4.2.1) and the above post-patterns of outcomes shows that this case study had pattern-matched, leading to the improvement of tools and positive changes in the participants' KE practice and activities. Out of the cross-case synthesis emerged the finding that consensus appeared to occur when all members of a group had developed not just an agreement over a course of improvement actions, but a 'shared learning'. The workshop helped participants to learn how to use and improve tools through the process, providing feelings **of control over resources, decisions, actions and activities (Stringer, 2007, p.23)** as the effects of this research activity and as a higher-plane concept. Therefore, the interpretations of the pattern-matching procedure in this case study suggest that the initial predictions stand more robustly within the Improvement Matrix framework.

The following section summarises the process extracted from practice by building on the activities done in the workshop, how participants responded to the activities, and how the improvement of the tool developed their engagement practice.

7.1.5 Case study summary of results and findings

In this section, each heading describes the results of testing the three design propositions (Instructions, Functionality, and Flexibility) within the design layer of practice (4.2.1), as a response to the questions about the case (**Level 2 question**) and verbalised to participants (**Level 1 question**). It summarises the process extracted from pattern-matching analysis and empirical findings by compiling the key information in three aspects: (1) activities done in the workshop, (2) how participants responded to the activities, and (3) how the improvement of the tool developed their engagement practice, as follows.

Improving tools within the design layer of practice

Participants improve tools by providing more open and flexible design concepts that give practitioners more control over the KE design process and also flexibility in using and understanding tools. Improving tools through the design layer of practice involves extending features, providing more instructions, new ideas to address challenges in order to give more flexibility to practitioners.

Challenge / Briefing

Activity: Designers look at the briefing that instructs practitioners on how the tool can address engagement challenges, and then suggest improvements to the way the tool could be used to solve a contextual challenge.

How? Designers will evidence the lack of clarity in the instructions and restrictive aspects of the tool, and then generate ideas on how to improve the instructions such as:

- Additional instructions and examples to inspire different uses and to show how the tool might work.
- Additional features to stimulate discussions or to enable a more open and flexible system

How does this component improve the KE design practice?

By improving this component, a tool is improved so as to have a clear design concept and instructions, and enable more flexibility in personal understanding, and on how to use tools in practice.

Interaction models

Activity: Designers look at how the tool design concept addresses an engagement challenge, and then suggest ideas to improve the interactions required to enable creativity in a group of participants.

How? Designers will evidence the unclear, impractical and unrealistic aspects, and the inappropriate design elements of the tool, and generate ideas on how to improve the concept such as:

- Different resources to creatively and collaboratively address an engagement challenge
- Additional guidance (e.g. prime exercises or roles)

How does this component improve KE design practice?

By improving this component, designers can provide new tool ideas and features on how to collaboratively address an engagement challenge and also improve the usability of the tool.

(Build) Resilience

Activity: Designers look at how the tool design concept accommodates unforeseen applications, and then suggest ideas to improve the resilience of the tool.

How? Designers will evidence restrictive aspects of the tool, and suggest ideas to improve the flexibility such as:

- Editable content (e.g. electronic format)
- Extended features
- Additional information to contextualise the tool (e.g. time duration)

How does this component improve the KE design practice?

By improving this component, designers can expand applications of the tool and give users more control and understanding about a tool, providing practitioners more space to think about engagement challenges.

7.2 Case study 2: Developing the improvement matrix through the facilitation layer practice

In this workshop, the researcher worked together with Children’s Champions, a team from a joint health and care system called Integrated Care Communities in North West England. The team is a group of multidisciplinary healthcare practitioners responsible for engaging with children and young people (YP) in their local communities to get their needs and voice listened to and heard. The team leader attended a Leapfrog tool sharing event at the Blackpool Teaching Hospitals on the 23 of January 2018¹⁹ but wanted a session in Lancaster. Considering this opportunity, the researcher invited her to redesign tools to fit their practices through an improvement workshop.

¹⁹ Blackpool Teaching Hospitals NHS Foundation Trust — Rigorous stories toolsharing <http://leapfrog.tools/blog/blackpool-teaching-hospitals-nhs-foundation-trust-rigorous-stories-toolsharing/> [accessed 30 January 2018]

Through email negotiations and a phone conversation, the researcher familiarised with their services and processes in order to design an improvement workshop. The children's champions team were looking forward to getting better assets, engagement, and including YP's voice in their bimonthly meetings. Considering their practice, the researcher shortlisted five tools that could be used for capturing young people's voice, translating evidence, and sharing engagement outcomes across teams and organisations.

The researcher delivered a half-day workshop that focused on improving the YP engagement practice with tools to the children's champion team held on the 26 of July 2018 at ImaginationLab (figure 42). The objective of the workshop was to test the three components of the facilitation layer of the framework in order to understand how engagement practitioners improved tools in practice. In this workshop, seven participants explored the facilitation of activities using tools, and generated ideas to improve these tools to support the Young People and Children engagement practices.



Figure 42. Improvement workshop delivered to the Children's champion team at the ImaginationLab

Building on the previous workshops, the researcher asked participants to do three different activities, where each activity corresponded to one component of the improvement matrix highlighted in Table 22 below. This workshop was planned to be delivered to over 10 participants, but due to an unexpected event on the day of the workshop, only 7 people attended it. The plan and enactment of the plan are described in the following sections.

Table 22. Facilitation layer

Dimensions Layers	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
FACILITATION	Facilitator notes	Resources produced by facilitator	(Encourage) Facilitator responses

7.2.1 Planning

In this 3-hour workshop, the Children’s champions team critiqued and suggested a set of improvements to the tools in three different ways, and concluded the session by evaluating and reflecting on which suggestions led to the development of their own practices. The seating arrangement was designed in the same way as the previous workshops, where three stations with two to three chairs and one table were put together and close to each other, so participants could easily to change stations at the end of each of the three rounds of improvements. The researcher included a consensus activity to the plan to enable participants to choose three out of the five preselected tools to be improved in the workshop. This activity consisted of asking each participant to choose two tools they would like to work with during the workshop, where small cards representing each tool were stuck on a whiteboard, and participants had to vote by ticking the two tools they would like to work with on the workshop. The research plan and details of the plan are described below. The research plan and details of the plan are described below.

Table 23. Workshop 2 plan

Duration	Activity	Requirements & Breakdown
INTRODUCTION		
15 min	Arrival & Coffee	Participants complete a consent form, name badge, Intro Card tool, and sit at different stations.
14 min	Introduction and tools presentation	Present Leapfrog project, definition of tool, workshop objective, the intention of five tools, and workshop agenda and instructions.
5 min	Consensus activity	Participants choose the tools that they wanted to explore in the workshop through voting
1 min	Workshop instructions	Present the workshop agenda, the workshop process and instructions.
ROUND I. Improving instructions		
15 min	Identify issues	Participants review the instructions for facilitators
10 min	Co-design improvements	Participants suggest improvements to the instructions for facilitators
CHANGE STATIONS		
ROUND II. Improving functionality		
10 min	Identify issues	Participants explore the facilitation resources
10 min	Co-design improvements	Participants suggest improvements to the facilitation resources
10 minutes break - CHANGE STATIONS		

ROUND III. Improving flexibility		
15 min	Test flexibility	Participants explore different ways to facilitate an activity using the tools
10 min	Co-design improvements	Participants suggest improvements to encourage facilitator responses
RETURN TO THE INITIAL STATION		
EVALUATING AND REFLECTING		
45 min	Evaluate and reflect	Participants look across all improvement suggestions for the tools, rate suggestions, and share their findings.
5 min	Feedback	Ask for other feedback?
	Wrap-up	Conclusion and appreciation for participants' help

INTRODUCTION

The intro card activity was not part of the activity as participants knew each other from previous monthly and bimonthly meetings at the joint NHS trust partnership.

Contextualisation – The researcher introduces the project, definition of tools, workshop agenda, objective, and instructions. Then, the researcher highlights that the focus of the workshop is to improve tools considering the practice of engaging with young people, as the team is composed of healthcare and social care workers across organisations who worked with different communities, such as elderly people.

Tools presentation and selection - The researcher presents five tools that were shortlisted before the workshop (Figure 43), and then asks participants to choose three tools through a simple voting system to reach a consensus in the group.

A FRAMEWORK FOR IMPROVING KNOWLEDGE EXCHANGE TOOLS

Role bingo

- a tool to define roles and responsibilities
- Helps you plan out all the tasks needed to make an event a success
- Divide and allocate tasks between a group
- Less formal, and more fun



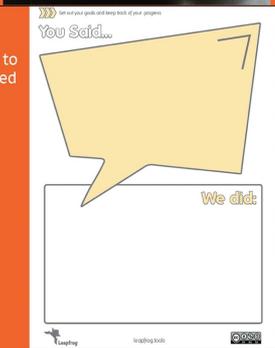


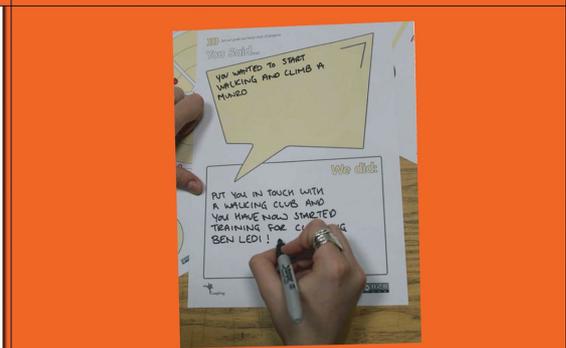


You said, we did

- a simply way for a service provider to feedback to users actions taken based on their evaluation feedback
- Make action more visible
- Give it to a person or use it as a notice board







The Small Things

Team communication, Planning resources

- helps by offering a fun and friendly way for staff team members to prompt, provoke, ask questions and obtain feedback from each other
- for teams who work for different services and use the same building at different times of the day

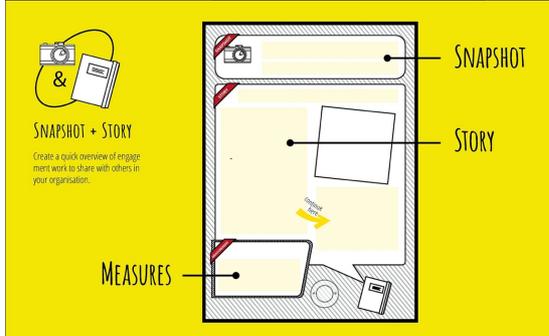






Snapshot + Story

Create a quick overview of engagement work to share with others in your organisation.



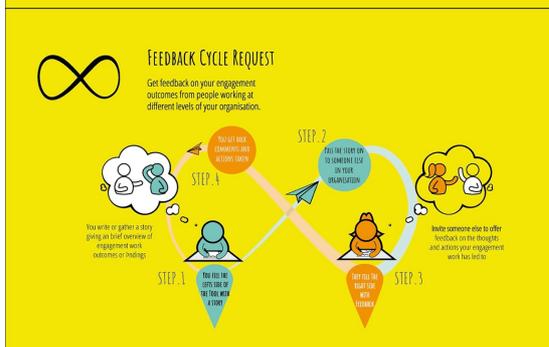
Snapshot + Story

Create a quick overview of engagement work to share with others in your organisation.



Feedback Cycle Request

Get feedback on your engagement outcomes from people working at different levels of your organisation.



Engagement Map Key

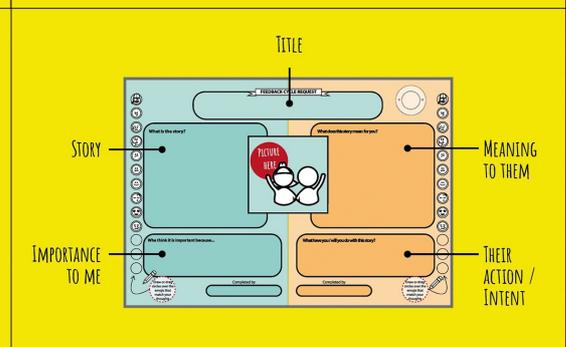


Figure 43. Tools presented in the workshop and examples of use. Tools: Flow customer tools, Storyboard contract, The right ideas, Engagement Map key, Feedback cycle request, and Snapshot + Story

ROUND I, II, III – Critiquing tools and suggesting improvements

	INSTRUCTION	FUNCTION	FLEXIBILITY
ROUND I			
ROUND II			
ROUND III			

These phases follow similar instructions as in Pilot study 2. The researcher asks participants to critique the tools and suggest improvements, where he poses a question related to one component of the facilitation layer in each round, providing examples on how to complete the task (Figure 44). Once participants finish the task in each round, the researcher asks participants to move to the next station to do the succeeding rounds until they come back to their initial station for the evaluation and reflection phase.

Task 1

Review the instruction for facilitators and **highlight** where you wish you could change it

Example

Improve it Leapfrog

Can you give suggestions to improve the instructions for facilitators?

Example

- 1 Use 3D shapes. For instance: Peeps instead of people
- 2 Make it more visible. Use another icon to represent the task. It could be a pencil and an eraser instead of a scissor and pencil
- 3 Give examples on HOW to fill in the blank SPACE

Figure 44. Examples on how to complete the task 1 – review and give suggestions to improve the instructions for facilitators.

EVALUATING AND REFLECTING - Testing ideas and learning from the test

Looking across all suggestions and discussing which suggestions led to improvement: In this phase, participants assess the proposals for each tool under the labels: Instruction for facilitators, resources for facilitators, and flexibility for facilitators. Participants fill in a similar evaluation form as used in the previous workshops, and share the learning from before and after improvement suggestions to the Children's champions team.

Extra feedback on tools – The researcher prompts participants to share any other thoughts or feedback about the tools.

Contingency time and wrap-up – The researcher thanks participants, gives them postcards, provides a timescale for the delivery of new versions of tools, and invites them to be part of Leapfrog Facebook group discussion.

7.2.2 Acting, observing and reflecting in practice

This section presents the implementation of the plan, describing the improvement activities as a basis for researcher's reflection.

INTRODUCTION

The delay at the beginning did not affect the facilitation of the workshop as the researcher knew how to manage the workshop and made it more flexible. These facilitation skills acquired through previous case studies enabled the researcher to deliver a more effective workshop without significant issues. The researcher followed the introduction phase as initially planned, where he presented the Leapfrog project, tools, workshop objectives, and agenda, and then run the consensus activity. Through simple voting systems, the group of participants selected three tools to work on this workshop (Figure 45). The interesting fact here is that the team leader kept reminding participants to focus their efforts on improving engagement with the young people community they work with.

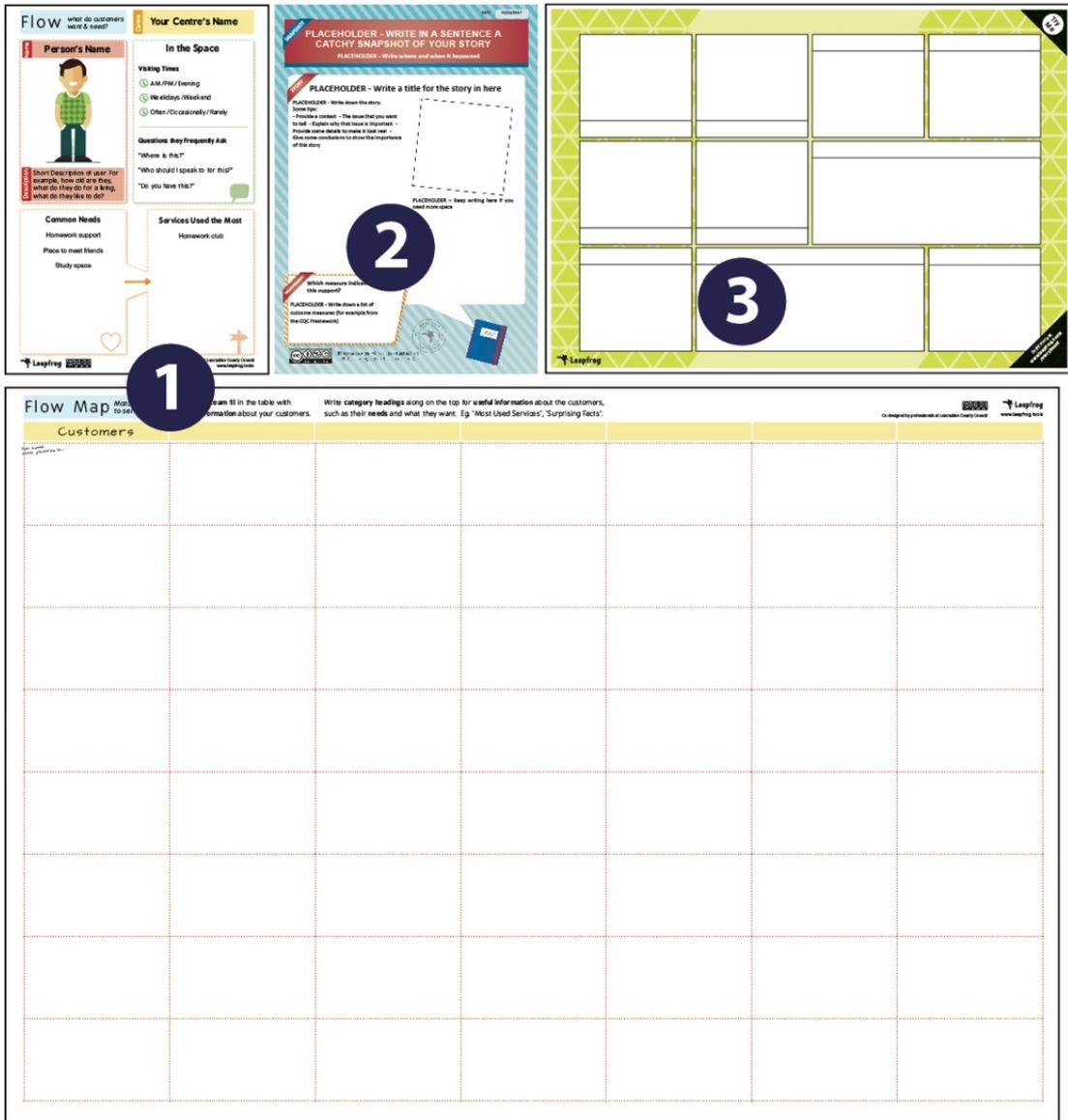


Figure 45. Most voted tools (1) Flow customer tools, (2) Snapshot + Story, (3) Storyboard contract (see Appendix C for larger images)

ROUND 1. Improving facilitator notes

Each group of participants reviewed the instructions for facilitators and suggested ideas to improve the tool. In this round, the improvement process did not generate many critiques and ideas for improvements in all three groups for the following reasons.

	INSTRUCTION	FUNCTION	FLEXIBILITY
LEVEL			
FACILITATION			

The first group tried initially to explore and understand the Flow customer tools (1) and did not look at the instruction sheet that was provided together with the set of tools. They found the tools difficult to understand and use in practice. The second group reported that the Snapshot + Story (2) was a very good tool, and they said they wanted to use in practice before suggesting improvements. During the 10 minutes break after the Round 2, the researcher talked with one of the participants of this group to understand his engagement process. The participant said he facilitates groups using traditional consultation approaches for collecting data, such as flipcharts and facilitation techniques. The third group was looking at the Storyboard contract (3), where there were few instructions available to facilitators.

This tool was the only one that generated evidence on how to improve the facilitator notes, providing suggestions on the **indications of use for different audiences** as shown in Figure 46. Participants tried to understand the tools by using the tool first instead of reading the instructions.

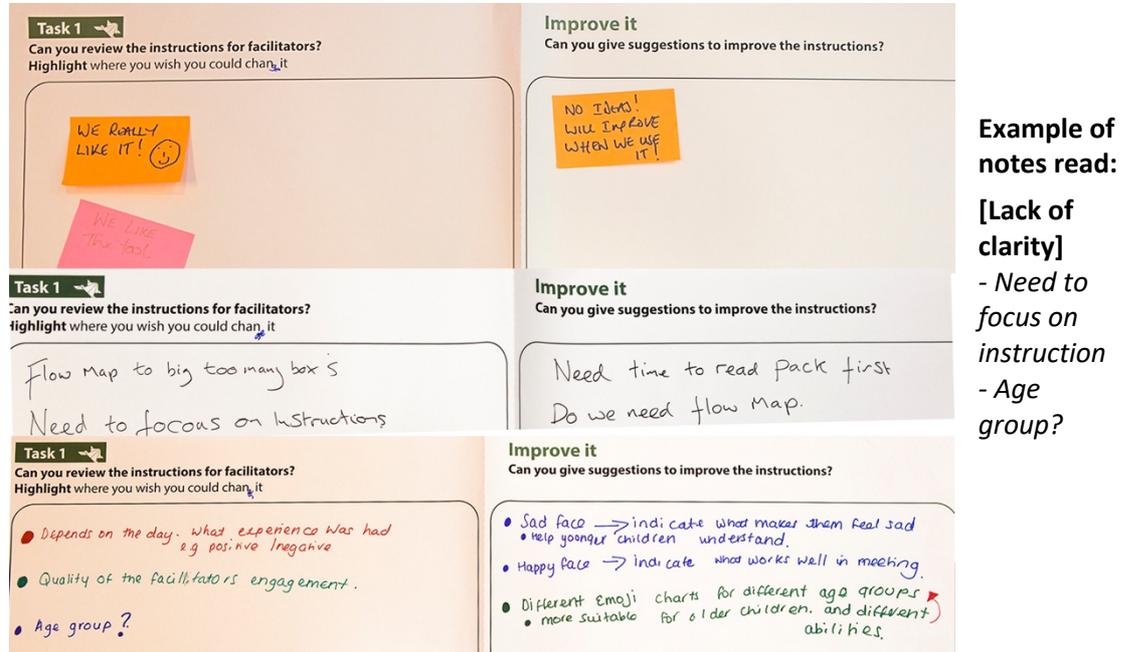


Figure 46. Participant responses to the facilitator notes improvement task (See Appendices I and J for raw data and transcriptions)

Examples of suggestions to improve instructions

[More instructions - Indications of use]

- Different emoji charts for age groups
- More suitable for older children and different abilities- Sad face > indicate what makes them feel sad
- Help young children understand
- Happy face > indicate what works well in meeting

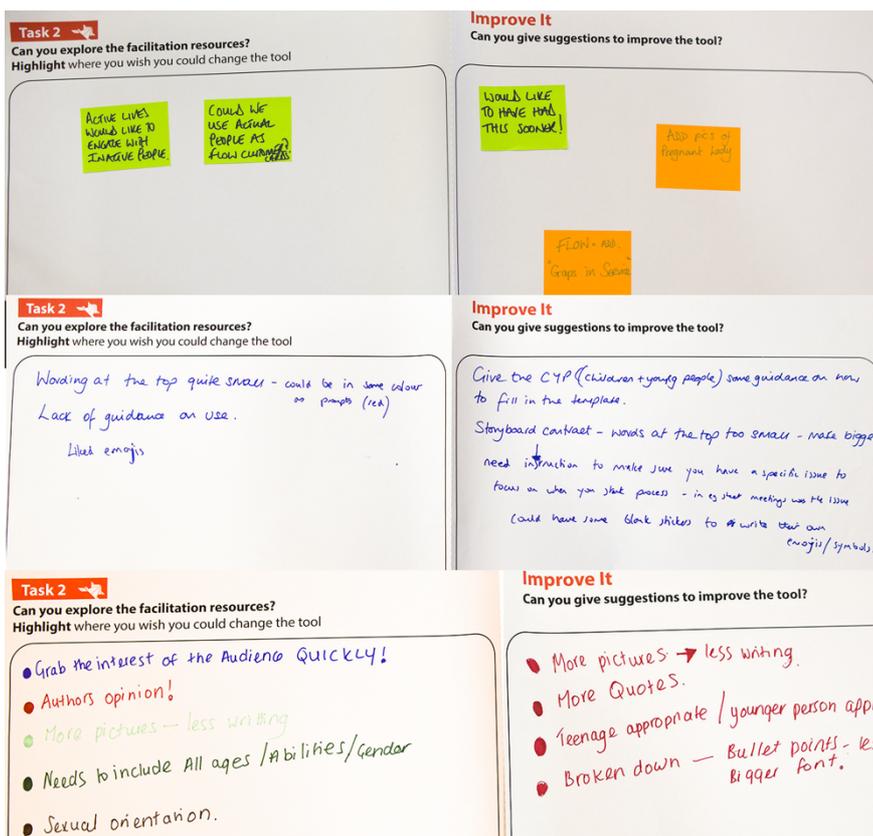
[Remove features]

- Do we need flow map

[ROUND 2] Improving resources produced by facilitators

Once participants changed stations and tools, each group of participants explored the facilitation resources (the tool), evidencing the issues to their practice, and then provided suggestions to improve the tool. In this activity, all groups managed to evidence issues and generate more ideas to improve tools. As soon as they concluded this round, some participants expressed feelings of pride as they could not contribute much in the previous round. When participants were looking at the resources for facilitators, they evidenced **the lack of clarity**, **the restrictive aspects**, and **the unrealistic features** of the tools. Participants’ suggestions for improvement involved providing **changes in the type of interactions and additional resources** to make tools more appropriate to a wider audience, and **practical instructions** to guide participants through the process as shown below.

	INSTRUCTION	FUNCTION	FEASIBILITY
LEADER			
FACILITATION			



Example of notes read:

[Lack of clarity]
- Wording at the top quite small
- Lack of guidance on use

[Restrictive aspects]
- More pictures - less writing
- Needs to include All ages / abilities / gender
- Sexual orientation

[Inappropriate design concept]
- Could we use actual people as flow customer cards?

Figure 47. Participant responses to the facilitator resources task (See Appendices I and J for raw data and transcriptions)

Examples of suggestions to improve functionality

[Add resources or change the type of interactions]

- Add pics of pregnant lady
- More pictures - less writing
- Teenage appropriate / younger person appropriate
- Broken down - bullet points - less wordy
- Could have some blank stickers to write their own emojis / symbols

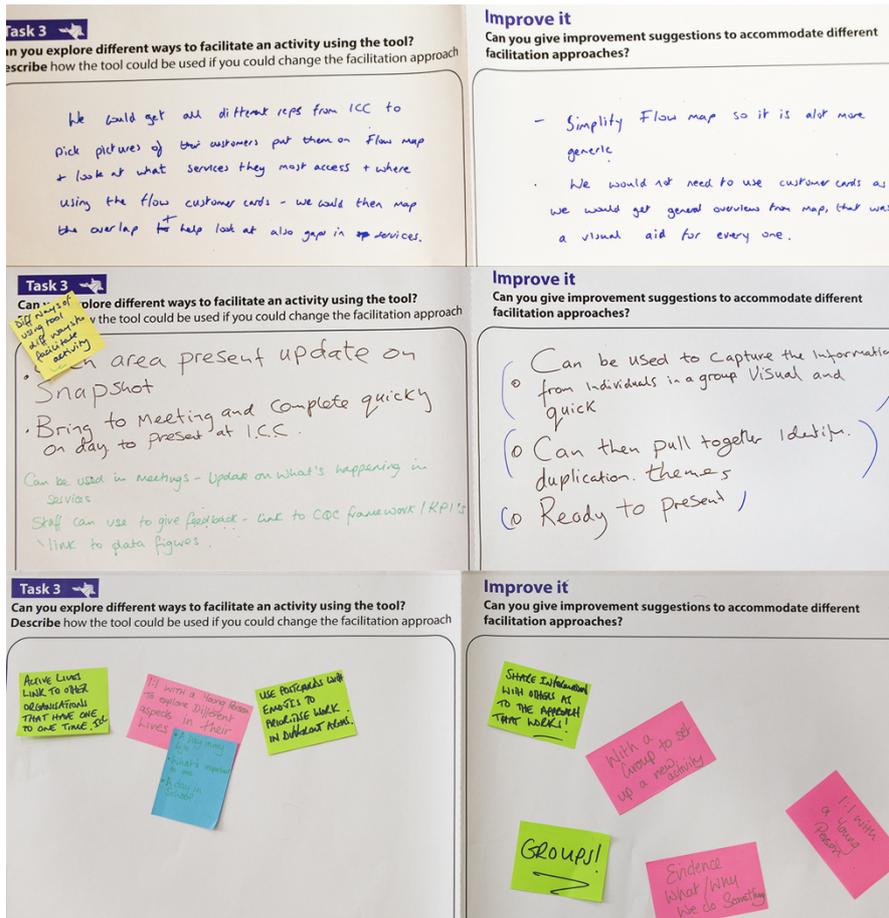
[More instructions / Guiding participants]

- Give the CYP (children + young people) some guidance on how to fill in
- Need instruction to make sure you have a specific focus on when you start the process
- Flow = add Gaps in service

ROUND 3. Improving facilitator responses

One participant had to leave early, so one group had to be rearranged in order to have two people in each station. In this round, each group explored different ways to facilitate an activity using a tool and described how it could be used if they could change the facilitation approach. Then participants suggested improvements in the tools to accommodate different facilitation approaches. They evidenced two ways to improve the facilitator responses with a tool: One group of suggestions involves **simplifying resources or removing unnecessary elements**, and the other group of suggestions involves **setting and sharing activities as a group** as shown below.

	INSTRUCTION	FUNCTION	FLEXIBILITY
TOOL			
FACILITATION			



Example of notes read:

[Examples of different uses]

- Each area present update on Snapshot
- Bring to meeting and complete quickly on day to present at ICC
- Can be used in meetings – Update on What’s happening in services
- Staff can use to give feedback – link to CQC framework / KPI’s link to data figures

Figure 48. Participant responses to the facilitator response task (See Appendices I and J for raw data and transcriptions)

Examples of suggestions to improve flexibility

[Set and share activities in groups]

- Setting a new activity with a group
- Share information with others as to the approach that works

[Simplify or remove unnecessary features]

- Simplify Flow map so it is a lot more generic
- We would not need to use customer cards as we could get general overview from map, that was a visual aid for everyone

EVALUATION AND REFLECTION - Testing ideas and learning from the test

Once all the group of participants finished the last round, they moved back to their initial stations and tools. Firstly, they looked across all completed proformas about their first tools and decided where improvements had been made, and rated each set of proposals in each tool as illustrated in Figure 49. Secondly, they presented the learning from before and after improvement proposals, and discussed which suggestions led to improvements with all groups. The completed evaluation sheets and results of their reflections are presented and grouped under each of the three evaluated dimensions of improvement as follows. An additional heading about the overall process at the end of this section provides evidence of participants’ learning and the effects of this research.

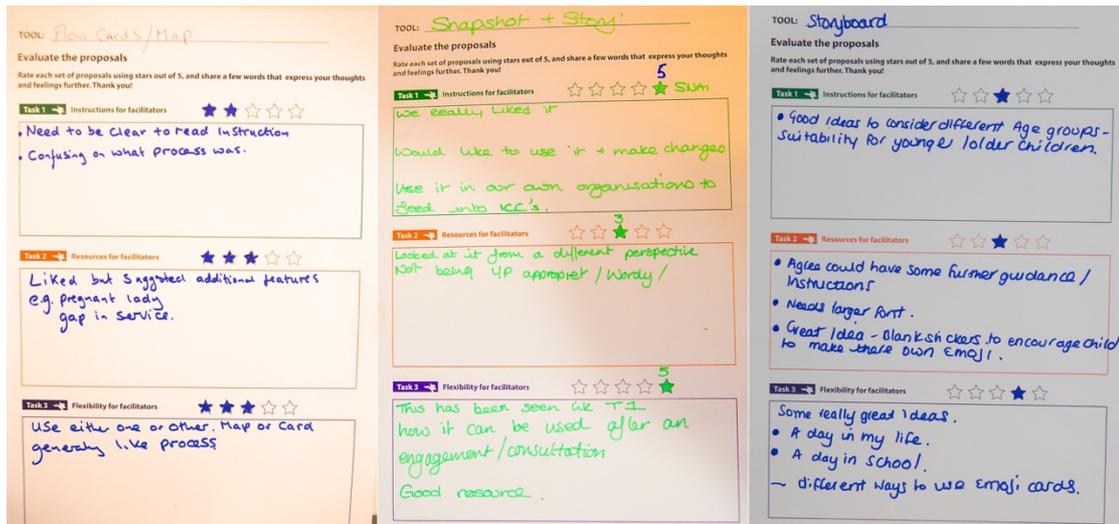


Figure 49. Participant responses to the evaluation task (See Appendices I and J for raw data and transcriptions)

Instructions for facilitators

In this phase, participants seemed to be assessing the quality of current instructions and not the proposals, as there were few suggestions for improvement. Overall, participants provided an average rating to the proposals and evidenced that **providing indication of uses for different audiences** would improve instructions but highlighted that they **need to use the tools first before making changes**.

[Indication of uses for different audiences]

- “Good ideas to consider different age groups – suitability for younger / older children”
- “I thought we did some good ideas to consider different age groups, and it was suitable for some young and older children, but I think the emojis will probably need a couple of re-digging a little bit.”

[Use it first to make changes in the tool]

- “Would like to use it & make changes”
- “Use it in our own organisations to feed into ICC’s”
- “We really liked it, we think is something that we’d like to use it to make changes because we don’t necessarily doing it at the moment. We could use it on our own organisations and also use it within the ICCs to sort of measure the engagement process we are doing, and the impact that is having”

Resources for facilitators

When evaluating and reflecting on the improvements on the resources for facilitators, participants provided an average rating to the proposals and evidenced that improving this dimension involves **providing further guidance**, and **creating additional resources** to make it more appropriate to a wider audience, which could be created by participants of an engagement activity. Some comments on these improvements are evidenced as follows.

[Additional features to expand tool applications]

- “Great idea – Blank stickers to encourage child to make their own emoji”
- “But I really like the idea of blank stickers to encourage the child to make their own emoji.”
- “Liked but suggested additional features e.g pregnant lady, gap in service”

[Further guidance and instructions]

- *"I definitely agree, I think it need some larger font, and some further guidance, and instructions."*

Flexibility for facilitators

Participants seemed to be assessing the flexibility of current tools and not the proposals, as there were few suggestions for improvement. When discussing the improvement suggestions on the flexibility for facilitators, participants provided a high rating to the proposals, evidencing that **simplifying use, making tools easy and generic** and **discussing, discovering and suggesting creative activities as a group** would provide more flexibility to the tools, as shown below

[Simplify use, make it easy and generic]

- *"Use either one or other. Map or card generally like process"*
- *"Suggested you could use either one or the other, either the map or the actual flow cards to make it easy and more generic."*

[Discuss, discover and suggest creative activities as a group]

- *"I like that for engaging with YP in a 1 to 1 or even in a group. I really like that, and I would like that my staff to use with YP to get, you know like. If a child is struggling with attending school, you can say: right, let's do this activity, what a day is like for you (yea yea), and they could really unpick that (yea yea)"*
- *"But you could also use it with a group of YP say: we've got this group, what do you wanna do for the next 6 weeks? And come up with a storyboard plan, they might like to do CSC (...), healthy eating one week, do cooking sessions."*
- *"Different ways to use emoji cards I saw some good ideas about kind of re-digging it for like a day in my life, a day in school, and some different ways to use the emoji cards."*
- *"It was again quite looking at our perspective that you've done a consultation with a group of YP or adults or whatever found a gap in service, you come up with a project, and this is a good way to presenting that evidence to things like your managers to ICCs"*
- *"It was interesting how different groups saw it differently."*

Overall process

At the end of the workshop participants commented on the process:

[Participants learnt through discovering tools and sharing approaches on how to improve their practice]

- *"I think it's pretty confusing, but I think is the beginning of a bigger earlier work, you know. Once you start mapping, it's a mapping tool. You know, it a big motivating step, that is how you are making difference to people, (yea), because you are getting this hectic of these specific groups"*
- *"I really like that, and I would like that my staff to use with YP to get, you know like. If a child is struggling with attending school, you can say: right, let's do this activity, what a day is like for you (yea yea), and they could really unpick that (yea yea), and I think the fact there emojis and also now, you said blank ones, which is a good idea, because it might be, turn around and say that you know."*

- *“it got me thinking about how much time we have to spend engaging with young people, I think the postcard with emojis is potentially good but how we can show them we are actually listening to them”*

- Through feedback emails after the workshop, the team leader expressed gratitude for helping the team to be more **inventive** in their organisation and promoting new thinking and ideas.

7.2.3 Reflections and insights

As a result of these workshops, the researcher designed improved versions of tools based on the evaluations and reflections where suggestions led to improvements as well as providing insights into the facilitating of such workshops. The main insights raised at this workshop are:

- **Participants’ experience** - The experience in using engagement tools might affect the quality of improvement suggestions. One of the participants was excited to use tools in practice, as he mentioned he employs traditional methods and techniques, such as focus group and flipcharts. His group mentioned the need to use the tool first before suggesting improvements.
- **Type of tools** – A very simple or complex tool might affect the quality of the improvement suggestions. A simplistic tool with lack of instructions, such as the Storyboard contract, can enable participants to generate good suggestions that lead to the improvement of a tool. Whereas, a complex tool, such as the flow customer tools, can be difficult to be understood by participants and lead to few suggestions of improvement as it has a ‘persona’ language used in professional design. Even though a participant had the opportunity to look again at the same tool in Round 3, she mentioned that she still struggled to figure out the design of the Flow customer tool.
- **Learning goes across different components** - Even though the researcher posed the questions in a way that participants could focus their efforts on one dimension at a time, participants will suggest improvements to other dimensions of tools from beginning to end. The same insight was recurrent in all case studies presented in this thesis.

7.2.4 Discussion of findings: within-case patterns analysis

This section discusses the findings across design propositions (Instructions, functionality and flexibility) as a result of the second and fourth analytical level of the framework described in Section 5.5.3, providing the responses to questions about the case and the pattern-matching logic between the theoretical predictions (4.2.2) and the empirical outcomes from this case study (7.2.2) as follows.

The objective of this workshop was to understand how engagement practitioners improved tools in practice by creatively responding to tasks framed to test the three components of the improvement matrix across the facilitator layer: **facilitator notes, resources produced by facilitators, and facilitator responses**. The findings from this workshop provided important insights on how these three components play out in practice, extending the understanding of the Improvement Matrix Framework. These findings and insights are described in the following paragraph.

In this case study, participants agreed upon a course of improvement for a set of tools by **helping facilitators to design engagement approaches and providing indications of use and**

practical guidance to participants on how complete tools throughout an engagement activity in order to enhance skills needed for the job of facilitation. Participants’ suggestions focused on indications of uses for different audiences, practical guidance using a tool, additional features that are appropriate to a wider audience, and setting and sharing activities as a group to improve a tool. In this sense, the facilitation layer can be used to improve tools to enable facilitators to enhance their skills and to constructively and creatively apply tools in the process of engaging with their audience, and therefore, following the definition of **good tools** discussed in Section 3.2.

A pattern-matching procedure, examining the predicted outcome (Section 4.2.2) and the above post patterns of outcomes shows that this case study had pattern-matched, leading to the improvement of tools and positive changes in the participants’ KE practice and activities. Out of the cross-case synthesis emerged the finding that consensus appeared to occur when all members of a group had developed not just an agreement over a course of improvement actions, but a ‘shared learning’. The workshop helped participants to learn how to use and improve tools through the process, providing feelings **of control over resources, decisions, actions and activities (Stringer, 2007, p.23)** as the effects of this research activity and as a higher plane concept. Therefore, the interpretations of the pattern-matching procedure in this case study suggest that the initial predictions stand more robustly within the Improvement Matrix framework.

The following section summarises the process extracted from practice by building on the activities done in the workshop, how participants responded to the activities, and how the improvement of the tool developed their engagement practice.

7.2.5 Case study summary of results and findings

In this section, each heading describes the results of testing the three design propositions (Instructions, Functionality, and Flexibility) within the facilitation layer of practice (4.2.2), as a response to the questions about the case (**Level 2 question**) and verbalised to participants (**Level 1 question**). It summarises the process extracted from pattern-matching analysis and empirical findings by compiling the key information in three aspects: (1) activities done in the workshop, (2) how participants responded to the activities, and (3) how the improvement of the tool developed their engagement practice as follow.

Improving tools within the facilitation layer of practice

Practitioners highlight the restrictive aspects of the tool and suggestions of different uses, and then suggest improvements by simplifying / removing and adding / extending features, providing editable headings, formats and instructions, and designing activities as a group. The improvement of tools involves enabling wider tool applications through different features, and providing ideas that give practitioners more flexibility in understanding and use or generating ideas as a group in order to build understanding in employing tools in creative activities.



Facilitator notes

Activity: Facilitators look at the guidelines on how to use a tool to support them to enable participants to creatively engage in a KE activity, and then suggest ideas to improve these guidelines.

How Facilitators will evidence the lack of clarity of the tool, and then suggest ideas to improve the instructions such as:

- Indications of use of the resources for different audiences (e.g. age indication)
- Deletion of unnecessary resources or instructions

How does this component improve KE design practice?

By Improving this component, a tool can indicate uses of the resources that are suitable for different audiences or that need a more specific design.

	Resource	Activity	Audience
Resource			
Activity			
Audience			

Resources produced by facilitators

Activity: Facilitators look at how the resources can support creative abilities among individuals in engagement activities, and then suggest improvements on how to better use resources to guide participants to achieve an agreed objective.

How? Facilitators will evidence the lack of clarity and restrictive aspects of the tools, and then suggest ideas to improve facilitation such as:

- Practical guidance on how to engage participants through the process
- Different interactions that are appropriate to a wider audience (e.g. different inputs)

How does this component improve KE design practice?

By improving this component, the addition of new resources and further guidance to a tool can improve the action of engaging with participants in an activity.

	Resource	Activity	Audience
Resource			
Activity			
Audience			

(Encourage) Facilitator responses

Activity: Facilitators look at how the tool can accommodate different approaches to facilitation, and then suggest improvements on ways they could enable creative exchange in multiple situations using the tool.

How? Facilitators will suggest how to facilitate different activities, and suggest ideas on how to improve the flexibility such as:

- Setting a new activity with a group
- Sharing approaches that work

How does this component improve the KE design practice?

This component can improve the facilitation practice by simplifying the tool, discovering and discussing how to apply the tool in different activities, suggesting creative ways to use the resources.

7.3 Case study 3: Developing the improvement matrix through the application layer practice

In this workshop, the researcher worked together with Lancashire Care Quality Team to collaboratively redesign tools to improve their practice. The healthcare improvement group was composed of multidisciplinary teams that deal with complaints at diverse levels. Members of the management team attended two tool-sharing events: one at the end of October 2017²⁰, and the other at the beginning of December 2017, called the Leapfrog tool

²⁰ <http://leapfrog.tools/blog/lancashire-care-quality-improvement-team/>

fest²¹. In the latter event, a variety of Leapfrog tools were shared with practitioners interested in activating engagement in others, engaging wider and deeper, engaging within their organization, and building their own engagement toolbox. The management team was impressed with these two sharing events. They believed the Leapfrog tools would benefit them and were interested in creating their own tools for their organisation. Considering this opportunity, the researcher invited the Lancashire Care Quality Team to redesign tools to fit their practices through an improvement workshop.

Through informal online documents available on the organisation's website²² and email negotiations, the researcher familiarised with their services and processes in order to design an improvement workshop. Considering their practice, the researcher shortlisted seven tools that could help them to gather feedback from their communities, to map ideas and opportunities, to enable their communities to respond to their feedback, and to communicate improvements to their communities and wider team prior to the workshop.

The researcher delivered a half-day workshop that focused on improving the practical use of tools to the improvement officers team held on the 5 of April 2018 at ImaginationLab (Figure 50). The objective of this workshop was to test the application layer of the framework in order to understand how engagement practitioners improve tools in practice, where 15 participants worked on the third layer of the improvement matrix.



Figure 50. Improvement workshop delivered to the Lancashire Care Quality Improvement team

²¹ Leapfrog Tool Fest: Tools for Engagement, Consultation & Collaboration <https://connected-communities.org/index.php/events/event/leapfrog-tool-fest-tools-for-engagement-consultation-collaboration/>

²² Lancashire Care NHS Foundation trust – Quality Account 2016/2017 <https://www.lancashirecare.nhs.uk/media/Publications/Corporate/Quality%20Accounts/Final-Quality-Account-2016-17.pdf> [accessed 27 February 2018]

Building on the recommendations from the pilot studies, the researcher asked participants to do three different activities, where each activity corresponded to one component of the improvement matrix highlighted in Table 24 below. Although, the activities were the same ones presented in pilot study 2 (Section 6.2), the researcher allowed more time for participants to reflect and decide how effective the proposals in each round were. The plan and enactment of the plan are described in the following sections.

Table 24. Application layer

Layers \ Dimensions	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
APPLICATION	Example or use notes	Design of material	(Enable) Contrary activity

7.3.1 Planning

Building on the insights from the pilot studies, the seating arrangement was designed to enable participants to easily circulate during the workshop, where five stations were composed of one table with 3 chairs each. The researcher included the consensus activity in the plan to enable participants to choose three out of the five preselected tools to be improved in the workshop. This activity followed the same process as in the case study 2, where small cards representing each of the five preselected tools were stuck on a whiteboard, and participants had to vote by ticking the two cards they would like to work on at the workshop. The research plan and details of the plan are described below.

Table 25. Workshop 3 plan

Duration	Activity	Requirements & Breakdown
INTRODUCTION		
10 min	Arrival & Coffee	Participants complete a consent form, name badge, and sit at different stations.
14 min	Introduction and tools presentation	Present Leapfrog project, definition of tool, workshop objective, the intention of seven tools, and workshop agenda and instructions.
5 min	Consensus activity	Participants decide on the tools that they wanted to explore in the workshop through voting
1 min	Workshop instructions	Present the workshop agenda, the workshop process and instructions.
ROUND I		
15 min	Identify issues	Participants review the wording of the tools
10 min	Co-design improvements	Participants suggest improvements to the example or use notes
CHANGE STATIONS		
ROUND II		
10 min	Identify issues	Participants explore the design of material
10 min	Co-design improvements	Participants suggest improvements to the design of material

10 minutes break - CHANGE STATIONS		
ROUND III		
15 min	Test flexibility	Participants explore tools in a way they were not intended to be used
10 min	Co-design improvements	Participants suggest improvements to enable contrary activity
RETURN TO THE INITIAL STATION		
EVALUATING AND REFLECTING		
45 min	Testing and learning	Ask participants to look across all improvement suggestions for the tool, rate them, share their findings and discuss which suggestions lead to improvement.
5 min	Wrap-up	Conclusion and appreciation for participants' help

INTRODUCTION

Participants did not have to complete the Intro Card tool as they knew each other in the organisation. Shortening the time of this activity also helped to leave more time for the evaluation phase, and therefore following the recommendation that emerged in the pilot workshop.

Contextualisation– The researcher introduces the project, definition of tools and objectives of the workshop, and presents the workshop agenda, instructions, and seven tools that were shortlisted beforehand for the consensus activity as shown below.



Figure 51. Tools presented in the workshop and examples of use (Tools: Role Bingo, You said, we did, The Small Things, Topic tally, Feedback cycle request, Engagement map key, Snapshot + Story)

ROUND I, II, III – Critiquing tools and suggesting improvements

APPLICATOR	INSTRUCTION	FUNCTION	FEASIBILITY

These phases follow similar instructions as in Pilot study 2. The researcher asks participants to identify issues in the tool and suggest improvements, providing the same examples on how to complete the task used in the pilot 2. Once participants finish the task in each round, they move to the next stations to do the succeeding rounds until they come back to their initial station for the evaluation and reflection phase.

EVALUATING AND REFLECTING - Testing ideas and learning from the test

Looking across all suggestions, summarise learning and discussing which suggestions lead to improvement - This phase follows similar instructions as the pilot workshop 2. The researcher also changed the tool evaluation form, adding the evaluation question at the top and a blank line to be completed with the name of the tool in order to make the question clearer and to facilitate the evidence gathering as shown in Figure 52.

Can you discuss how useful is each set of proposals?

Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!

Task 1 **Words** ☆☆☆☆☆

Task 2 **Design of material** ☆☆☆☆☆

Task 3 **Flexibility** ☆☆☆☆☆

TOOL: _____

Figure 52. Workshop 3 - Evaluation form

Extra feedback on tools – The researcher prompts participants to share any other thoughts or feedback about the tools.

Contingency time and wrap-up – The researcher thanks participants, gives them postcards, provides a timescale for the delivery of new versions of tools, and invites them to be part of Leapfrog Facebook group discussion.

7.3.2 Acting, observing and reflecting in practice

This section presents the implementation of the plan, describing the improvement activities as a basis for researcher’s reflection.

INTRODUCTION

The researcher presented the Leapfrog project, the definition of tools, and the tools that could help the healthcare improvement officers to develop their practice. The researcher presented 7 different tools and asked participants to select five through a simple voting process, where each participant could choose 2 two tools each, and the 5 most voted tools would be the tools used in the workshop. The selected tools were ‘Role Bingo’, ‘You said, we did’, ‘The Small Things’, ‘Snapshot + Story’, and ‘Feedback cycle request’ (Figure 53). This activity enabled participants to choose the tools that they thought would be more appropriate for them instead of limiting them to work with tools that were preselected by the researcher.

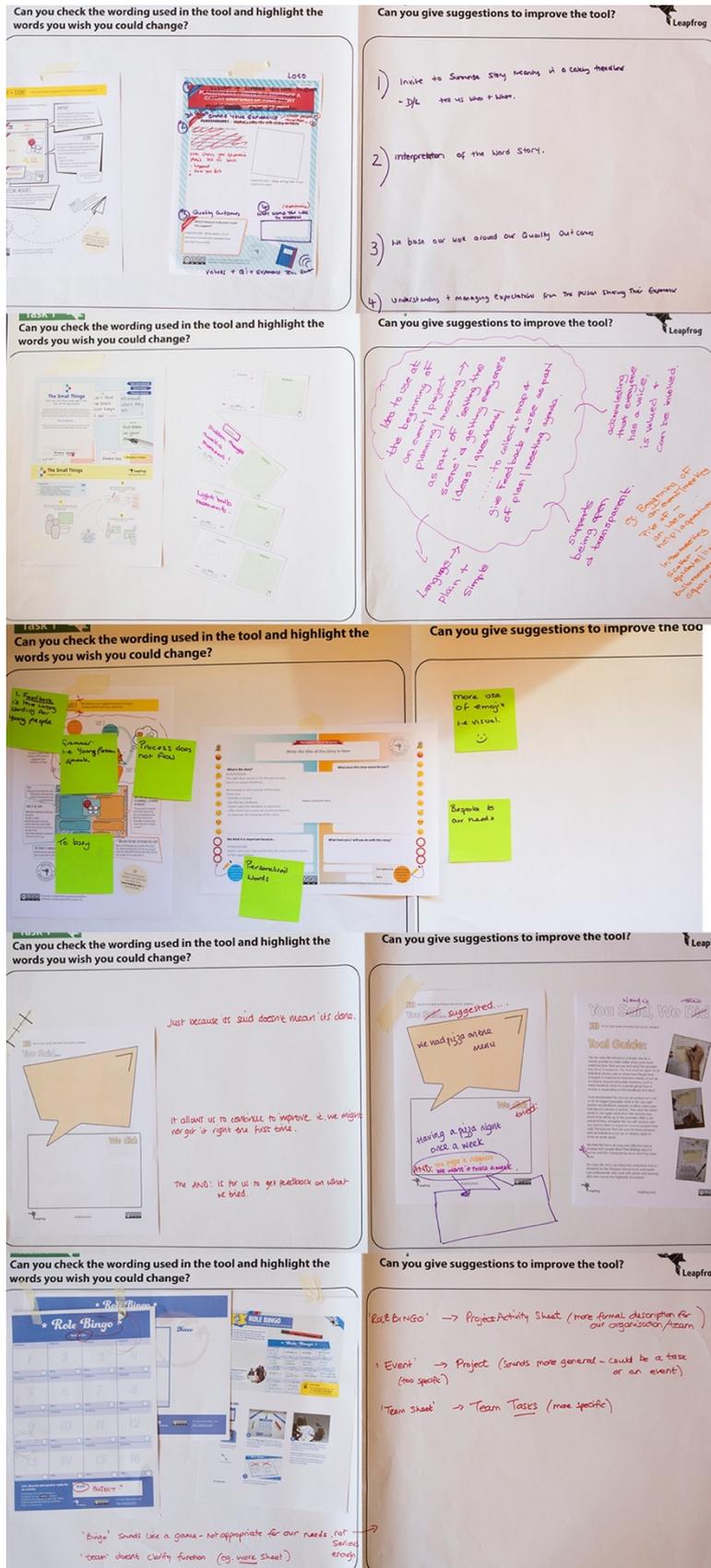


Figure 53. Most voted tools (1) Role Bingo, (2) Feedback cycle request, (3) The Small Things, (4) You Said, We Did, (5) Snapshot + Story (see Appendix C for larger images)

ROUND I – Improving example or use notes

Each group of participants looked into the wording of one of the five selected tools and evidenced the issues to their practice, and then suggested improvements. When participants were critiquing the wording of the tool, they were evidencing the **lack of clarity** that could lead to misunderstandings and other language issues in their context. Their suggestions involved proposing changes in the **communication style and uses**, such as graphic elements (e.g. stickers and boxes), and **different wording** to make the language more appropriate for their organisation and engagement processes as shown below:

	INSTRUCTION	FUNCTION	FEASIBILITY
EXAMPLE			
APPLICATION			



Example of notes read:

[Lack of clarity]
Misunderstandings
 - Team' doesn't clarify function (eg work sheet)
 Just because its said doesn't mean its done'
 - Too busy
 Process does not flow

Language issues
 - Feedback is the wrong wording for young people
 Grammar. E.g. young person speak '
 Bingo' sounds like a game - not appropriate for our needs, not serious enough

Examples of suggestions to improve instructions

[Provide different instructions - wording]

Catchy headline

- Title: What + Where you want to share
 - Invite to summarise story means in a catchy headline

Appropriate word for the organisation

Making the words more general or specific

- Event > Project (Sounds more general > could be a task or event)
 - Team sheet' > Team Tasks (more specific)
 - Quality outcomes

[Change communication style and uses]

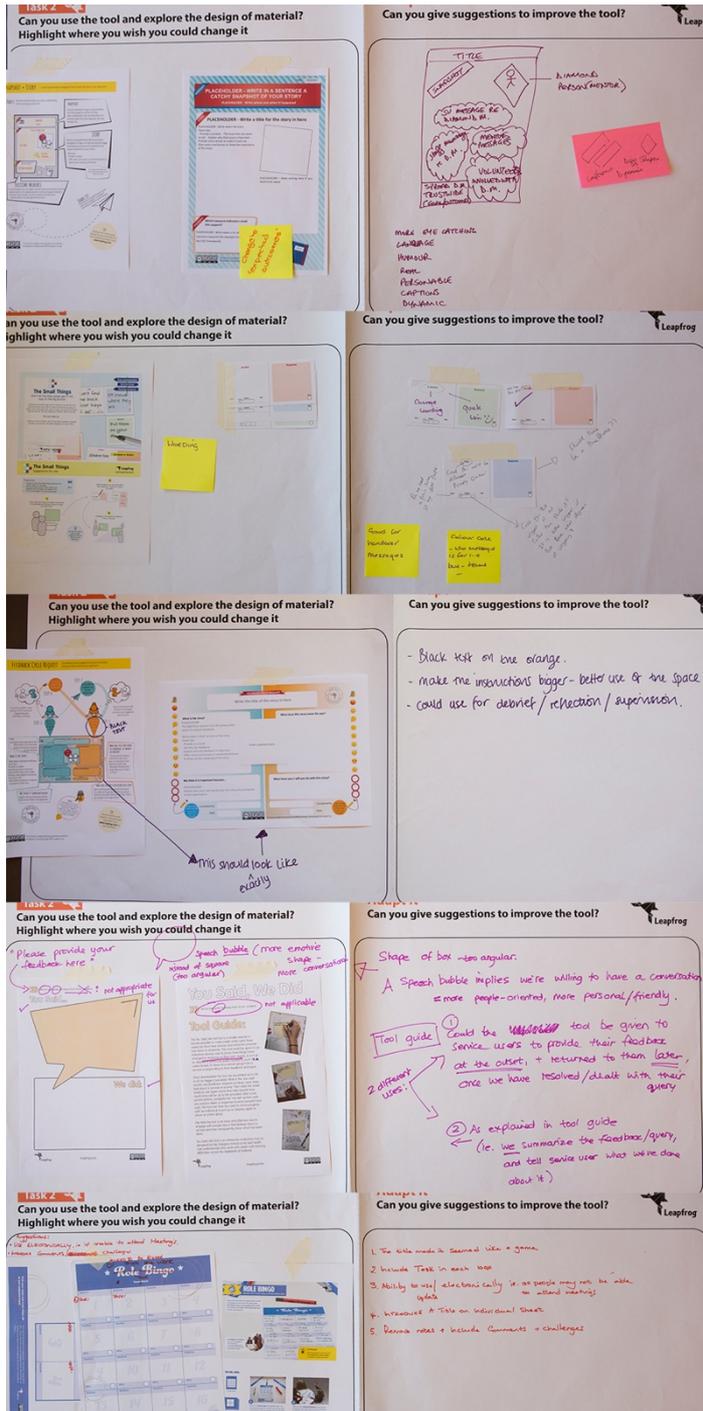
- More use of emojis. i.e. visual
 - Idea to use at the beginning of an event (...)
 - It allows us to continue to improve ie we might not get it right the first time' The AND: is for us to get feedback on what we tried'

Figure 54. Participant responses to the wording improvement task (See Appendices K and L for raw data and transcriptions)

ROUND II – Improving design of material

Once participants changed stations and tools, each group of participants looked into the design of material of a second tool, evidencing the issues to their practice, and then suggested improvements. When participants were looking into design of material, they were evidencing the **restrictive aspects** of the tool, and the **lack of clarity and inappropriate visual communication**. Their suggestions involved proposing **changes in the visual communication**, such as visual elements (e.g. stickers, boxes, format, and colour contrast), and **more instructions by adding new captions/headings** as shown below.

	INSTRUCTION	FUNCTION	FLEXIBILITY
LEARN			
APPLICATION			



Example of notes read:

- [Restrictive aspects]**
 - Use electronically
- [Lack of clarity]**
 - Please provide feedback here
 - Not appropriate for us
 - Change to expected outcomes
- [Inappropriate design concept]**
 - Speech bubble instead of square (too angular)
 - This should exactly look like (arrows to tool/guidelines sheet)

Examples of suggestions to improve functionality

- [Change the graphic design]**
 - Make the instructions bigger – better use of space
 - Black text on the orange
 - A speech bubble implies we're willing to have a conversation = more people-oriented, more personal/friendly
 - Could you tick urgent or not? Rather than shade it? It is either urgent or not there aren't degrees of urgency
 - Ability to use/electronically ie. As people may not be able to attend meetings

[More instructions]

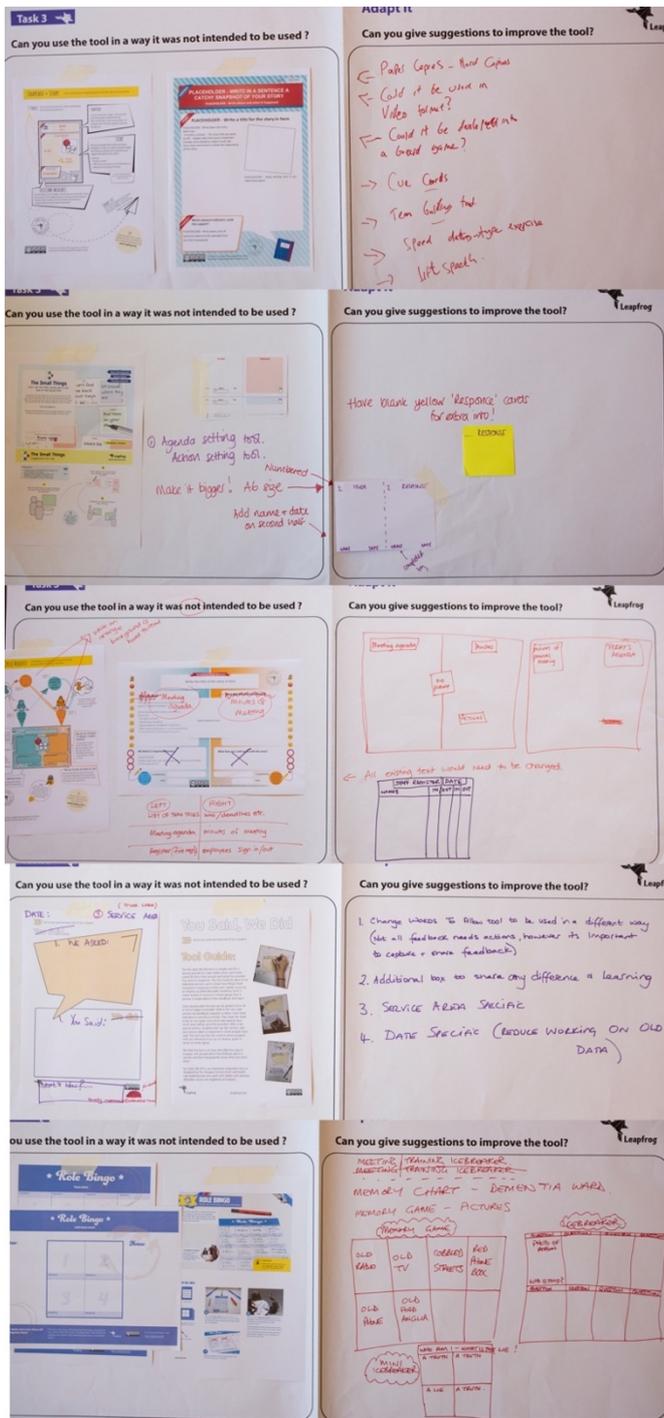
- Include task in each box
- Introduce a title on individual sheet
- Remove notes + Include comments + challenges

Figure 55. Participant responses to the design of material improvement task (See Appendices K and L for raw data and transcriptions)

ROUND III – Improving contrary activities

After a 10-minute break, participants came back to improve a third tool. Each group evidenced the flexibility in the practical use of tools, and then suggested improvements to the tool. When participants were looking into contrary activities with the tool, they were evidencing the **restrictions to unexpected uses**, such as paper size and current text, **inappropriate wording** and **different tool applications**. Their suggestions involved **additional resources and features**, **editable headings**, and **different formats** as shown below.

	INSTRUCTION	FUNCTION	FEASIBILITY
LEARN			
APPLICATION			



Example of notes read:

[Restrictive aspects]

- Make it bigger!
- White on orange background is hard to read
- All existing text would need to change
- (Crossed-out text)

[Examples of different uses]

- Meeting / Training icebreaker,
- Memory chart – Dementia ward,
- Memory game – Pictures
- (Sketches)

Examples of suggestions to improve flexibility

[Add or extend features]

- Have blank yellow 'Response' cards for extra info
- Additional box to share any difference in learning

[Different formats]

- Paper copies – Hard copies
- Could it be used in video format?

[Provide editable headings]

- Change Words to allow tool to be used in a different way

Figure 56. Participant responses to the (enable) contrary activity improvement task (See Appendices K and L for raw data and transcriptions)

EVALUATION AND REFLECTION - Testing ideas and learning from the test

Once all the group of participants finished the last round, they moved back to their initial stations and tools. Firstly, they looked across all completed proformas about their initial tools, and decided where improvements had been made by rating each set of proposals in each tool, as illustrated in Figure 57. Secondly, each group presented the learning from before and after improvement proposals and critically discussed which suggestions led to improvements. The completed evaluation sheets and results of their critical discussions are presented and grouped under each of the three evaluated dimensions of improvement as follows. An additional heading about the overall process at the end of this section provides evidence of participants' learning and the effects of this research.

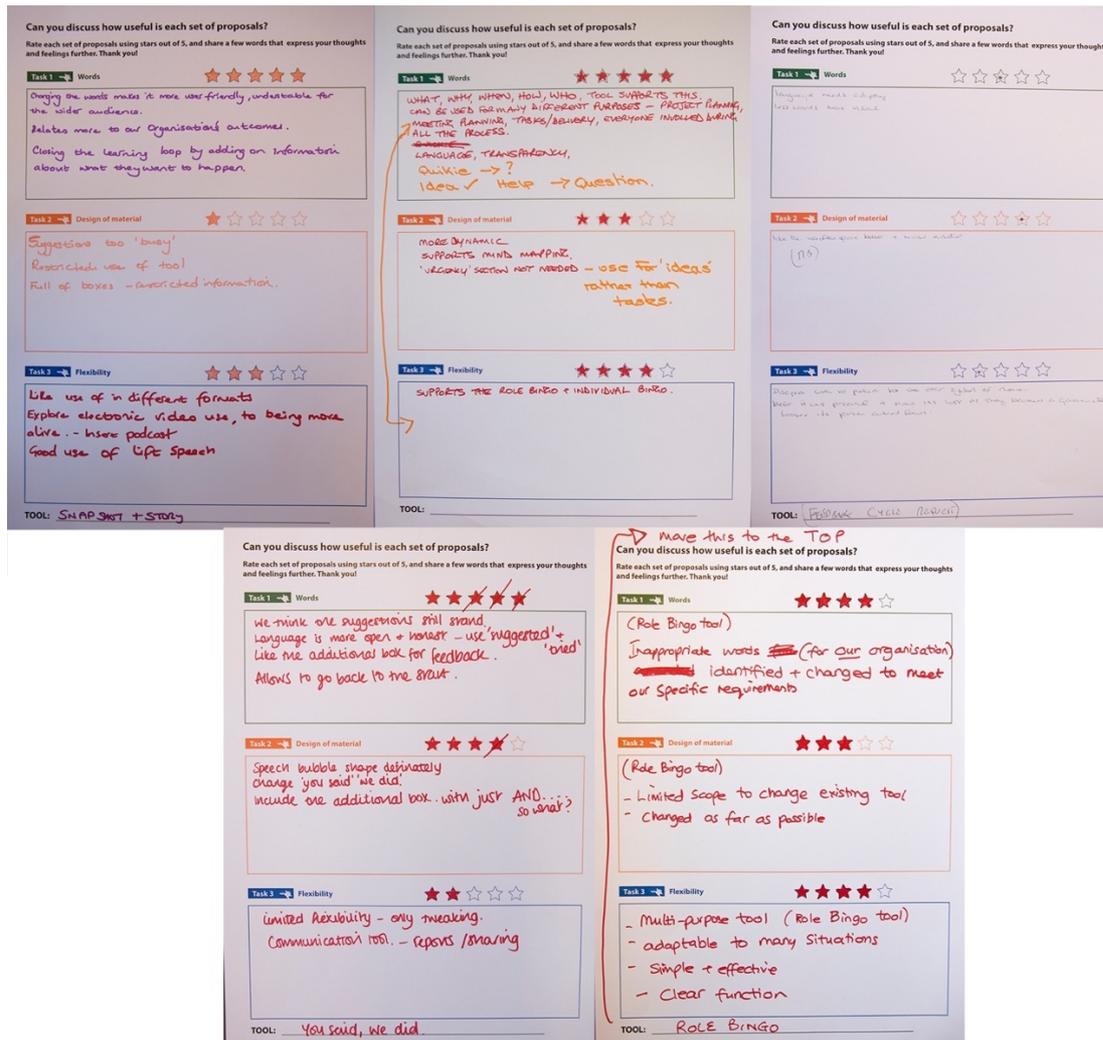


Figure 57. Participant responses to the evaluation task (See Appendices K and L for raw data and transcriptions)

Words

In this phase, participants highly rated the suggestions to improve wording, providing a rationale for them. In summary, improvements to wording led to a **more appropriate, friendly, and understandable engagement with their communities and organisation**. Some comments on these improvements are evidenced as follows.

[Provide more user friendly, understandable, and appropriate words for their organisation and for the community they engage with]

- *“We looked at the words, and for our organisation, changing the words makes more user friendly and understandable for a wider audience.”*
- *“We also felt that it'd be really good to put around or related to the organisation outcome, so having a box in the bottom, rather than saying indicators or measures it would be quality outcomes (...)”*
- *“Keep the language plain and simple, I acknowledge in that everyone has a voice and it's valued, and everybody needs to be involved. So, they can obviously input in various sections of the plans equals forward.”*
- *“We did the first bit and our work is actually 5 stars, we think the language, the words on it are not helpful. I know our trust we use we said and we did from friends and family, but we looked at it say things you suggested because you saying 'you said we did' implies everyone someone says something, we are going to do something different, it also implies when someone say something we completely understand what they are trying to say, and we interpreted, and the way we interpreted, we must be right. So, we changed the wording to 'You suggested and we tried', because that really fits into quality improvement tackle.”*

Design of material

When evaluating and reflecting on the improvements on design of material, participants provided a good rating in general and evidenced that improving the design of material provides a **clear and friendly graphic communication and documentation, and support to different uses**. Some comments on these improvements are evidenced as follows.

[Provide clear and friendly graphic design]

- *“Then include tasks in each box. So tasks are clearly documented”*
- *“We thought the suggestion that the tool that it has been used should represent the one on the description of the feedback, we thought that was an excellent suggestion. We thought it was really good suggestions, because I think there could be a potential confusion in there”*
- *“We really like some of the suggestions, that came back around having speech bubbles, so if we say on the screen is like a sharp edged bubble, and the suggestions was to have a rounded speech bubbles because it's softer, and implies a conversation could go on that cycle, keep us talking with people”*
- *“The other really good suggestions were make the instructions bigger, and better use of the space, we thought it was really a good idea.”*

[Add or remove features to expand applications]

- *“We found that the urgency section was not needed, use it more for ideas rather than tasks, but otherwise it was quite useful. It was mentioned about colour coding, that's okay if it's a small team, but if it's a big team. People forget what colour code they are. It would be better to put initials on it something like that.”*
- *“Change 'you said' 'we did' -Include the additional box with just AND.... So what?”*

(Enable) Contrary activity

When discussing the improvements to contrary activities, participants provided a good rating to the flexibility of tool and evidenced that adding new resources, features and words would

make tools adaptable to many situations and changing the format would make it more personal and alive, as shown below.

[Add adaptable headings to make tools more flexible to many situations]

- *“Add a name and date on the second half it says, and have a blank yellow response card for any other information people can add in. We felt that it was a good idea as well.”*
- *“so we put that box around ‘what’s new’, so we are actually what is new is we continue to communicate in an effective way”*
- *“It’s a bit like tailor to your audience, I think this is gonna be conversations around, it’s not just I’m gonna, it’s not making that environment and everyone on board of it”*
- *“Do you think there is a room for use for a simple project management tool. Because it’s not overcomplicated. (P1) no, it’s not overcomplicated. But you could make it complicate if you make into a simple project management tool”*

[Change the format to make tools more reasonable for individuals]

- *“We like the use of different formats, some of the suggestions were around exploring electronic video use, being that more alive.”*
- *“We felt like that having a picture or an image would be really helpful in terms of getting, making it more personal, making it more sense to the individual.”*
- *“(…) the suggestions were to make it bigger, maybe A6 size, which is half of the size of the A5 for anybody who is not a (unclear word)”*

Overall process

At the end of the workshop participants commented on the process:

[Participants learnt how to adapt (improve) tools on their own fields]

- *“they are all excellent tools. From the workshop we’ve done today, it shows adaptable you can use them, with ideals for people on their own field, and how you could adapt it.”*
- *“I think for me, we have conversations with the digital process, but some of the services we provide or support will not allow that to happen within those services is insecure environment. What I did like about this morning and the tools is the activities we did and how you presented it, and the format you presented it this morning. I think we said we will take it for us, for the event we are doing, and I really liked that. It was great!”*

- Through feedback emails after the workshop, participants thanked the researcher for delivering a worthwhile and useful workshop. One participant shared one of her tool adaptations for an upcoming event, including evidence of wider distribution of the tools.

7.3.3 Reflections and insights

As a result of this workshop, the researcher designed improved versions of tools based on their discussions about which suggestions led to improvements as well as provided insights on the facilitating of such workshops. The main insights raised at this workshop are:

- **Tool definition and workshop objective:** Providing a tool definition seems to be important to enable openness to new ideas as well as asking participants to focus on their own practice.

- **Types of participants might affect the type of improvements** - There was a disagreement about improving the tool to enable contrary activity in comparison with the pilot workshop. This might have happened due to types of participants who attended each workshop. While in the pilot workshop, the participants had similar roles as care leaver practitioners, participants of this workshop were a group composed of multidisciplinary health care specialists and teams. Although participants were from the same organisation, they worked in different teams and had distinctive challenges. Many agreements and disagreements occurred when improving contrary activities, which provided a better understanding on this layer of the matrix.
- **Learning goes across different components** – the learning acquired from previous rounds becomes part of the process and is perceptible across the rounds. For example, comments on wording were observed during rounds 2 and 3 of the workshop.
- **Identifying issues and suggesting improvements do not work separately** - The separation between evaluation and improvement does not happen in a real setting environment. These steps sometimes occur at the same time, where participants highlight issues and suggest improvements to a tool. One group did not follow the workshop instructions and unfolded the proforma before the researcher asked them to.

7.3.4 Discussion of findings: within-case patterns analysis

This section discusses the findings across design propositions (instructions, functionality and flexibility) as a result of the second and fourth analytical level of the framework described in Section 5.5.3, providing the responses to questions about the case and the pattern-matching logic between the theoretical predictions (4.2.3) and the empirical outcomes from this case study (7.3.2) as follows.

The objective of this workshop was to understand how engagement practitioners improved tools in practice by creatively responding to tasks framed to test the three components of the improvement matrix across the application layer: **example or use notes, design of material, and (Enable) contrary activity**. The findings from this workshop provided important insights on how these three components play out in practice, extending the understanding of the Improvement Matrix Framework. These findings and insights are described in the following paragraph.

In this case study, participants agreed upon a course of improvement for a set of tools by tailoring them to suit their community needs and practices, where they focus on **improving the content** in the tool. Their suggestions focused on improving **visual and written communication** through changing the words and graphic design of tools and adding flexible features and formats in order to make them more appropriate to their organisation and the communities they work with. These types of improvements go across three dimensions when they are used together to improve tools. In this sense, the application layer can be used to redesign tools to enhance skills and understanding in participants' engagement practices, following therefore, the definition of **good tools** discussed in Section 3.2.

A pattern-matching procedure, examining the predicted outcome (Section 4.2.3) and the above post-patterns of outcomes shows that this case study had pattern-matched, leading to the improvement of tools and positive changes in the participants' KE practice and activities. Out of the cross-case synthesis emerged the finding that consensus appeared to occur when all members of a group had developed not just an agreement over a course of

improvement actions, but a ‘shared learning’. The workshop helped participants to learn how to use and improve tools through the process, providing feelings **of control over resources, decisions, actions and activities (Stringer, 2007, p.23)** as the effects of this research activity and as a higher-plane concept. Therefore, the interpretations of the pattern-matching procedure in this case study suggest that the initial predictions stand more robustly within the improvement matrix framework.

The following section summarises the process extracted from practice by building on the activities done in the workshop, how participants responded to the activities, and how the improvement of the tool developed their engagement practice.

7.3.5 Case study summary of results and findings

In this section, each heading describes the results of testing the three design propositions (Instructions, Functionality, and Flexibility) within the application layer of practice (4.2.3), as a response to the questions about the case (**Level 2 question**) and verbalised to participants (**Level 1 question**). It summarises the process extracted from pattern-matching analysis and empirical findings by compiling the key information in three aspects: (1) activities done in the workshop, (2) how participants responded to the activities, and (3) how the improvement of the tool developed their engagement practice as follow.

Improving tools within the application layer of practice

Practitioners improve tools by tailoring them to suit their needs and practice. Improving tools through the application layer of practice involves changing the visual and written communication and providing flexible features and formats in order to make them more appropriate to their organisation and the communities they work with.

Example or use notes

Activity: Experts will look at the wording of a tool, and then suggest appropriate written communication to improve participants’ understanding and engagement in an activity.

How? Experts will evidence the lack of clarity and inappropriate wording on a tool, and suggest new wording in the tool to instruct participants such as:

- New wording: Catchy headlines, actual words used in the process, general or specific words, straightforward words
- Change communication style and uses: Fewer words and additional words

How does this component improve the KE design practice?

By improving this component, a new wording makes a tool more user-friendly and appropriate for an organisation, and wider or specific audiences.

Design of material

Activity: Experts will look at visual communication and elements of the tool, and then suggest improvements on how the graphic design is presented to participants of an activity.

How? Experts will evidence the inappropriate and restrict graphic elements of the tool (features, appearance, format, text and images), and suggest improvements to the visual communication of the tool such as:

- Different visual design
- Additional captions and headings

How does this component improve the KE design practice?

By improving this component, a tool provides additional features to expand applications, and a more clear and friendly graphic communication and documentation, supporting and enhancing practitioners’ engagement practice.

(Enable) Contrary activity

How? Participants will suggest unexpected uses of tools and suggest ideas to improve the flexibility of a tool such as:

- Additional flexible features
- Different formats
- Editable content

How does this component improve the KE design practice?

By improving this component, a tool provides more appropriate and catchier captions and graphic communication, making a tool more adaptable to many situations and easier for individuals to assimilate the information in the tool.

7.4 Cross-case synthesis and results

The synthesis process was carried out alongside the reporting process, enabling the refinement and recombination of categories, and the development of an overall framework. As each case study provided responses to level 1 and level 2 protocol questions (5.5.3), this section provides responses to level 3 protocol questions, where the questions about the pattern findings across multiple cases are described in the following subsections, presenting the cross-case synthesis and results.

7.4.1 How do practitioners improve tools using the instructions dimension?

	INSTRUCTION		
DESIGN			
IMPLEMENTATION			
APPLICATION			

This section presents the synthesis of the analysis in each of the three workshop phases as follows.

REVIEW the instructions

The interpretations of the cross-case analysis suggest that participants critiqued tools in similar ways, but each case study has presented its specificities in the process as shown below.

Table 26. Highlighting instructions issues

	Categories	Description
Design (Case study 1)	[Restrictive aspects] - Needs to be more generative - Limiting the primary research needed to speak of a specific group - Restrictive in terms of brainstorming opportunities / An ability to contextualize based on Audience - Community map = Extra rigid (linear)	Participants highlight restrictive aspects of the tool that limit practitioners’ creativity and understanding.
	[Lack of clarity] <u>Need more instructions</u> - Isn’t100% intuitive	Participants highlight language issues that are confusing and might

	<ul style="list-style-type: none"> - <i>Building bricks guidelines need more instruction</i> <u>Language issues</u> - <i>Language might alienate</i> - <i>'Team activity example' is a confusing heading</i> 	alienate, or features that need more instructions
Facilitation (Case study 2)	<p>[Lack of clarity]</p> <ul style="list-style-type: none"> - <i>Need to focus on instruction</i> - <i>Age group?</i> 	Participants highlight lack of clarity or instructions, such as indications of use.
Application (Case study 3)	<p>[Lack of clarity]</p> <p><u>Need more instructions</u></p> <ul style="list-style-type: none"> - <i>Team' doesn't clarify function (eg work sheet)</i> - <i>Just because it's said doesn't mean it's done'</i> - <i>Too busy, Process does not flow</i> <p><u>Language issues</u></p> <ul style="list-style-type: none"> - <i>Feedback is the wrong wording for young people</i> - <i>Grammar. E.g. 'young person speak 'Bingo' sounds like a game – not appropriate for our needs, not serious enough</i> 	Participants highlight lack of clarity in instructions and language issues , such as unclear functions and features or inappropriate wording for their audience or needs.

As shown in the table above, participants' critiques involve highlighting the **lack of clarity**, **language issues** and **restrictive aspects** of the tool.

IMPROVE the instructions of tools

The interpretations of the cross-case analysis suggest that participants improve tools in similar ways, but each case has presented its specificities in the process as shown below.

Table 27. Improving instructions of the tools

	Categories	Description
Design (Case study 1)	<p>[Provide more instructions]</p> <ul style="list-style-type: none"> - <i>Provide inspiring examples</i> - <i>Use more images of how this might work</i> - <i>Provide more instruction on activity</i> 	Participants suggest improvements on how the tool might work .
	<p>[Additional flexible or stimulating features]</p> <ul style="list-style-type: none"> - <i>Prompt cards to stimulate discussions</i> - <i>Add Multimedia features (photos, moods, comments etc)</i> - <i>Redesign brick template</i> - <i>Would benefit from more open // flexible system</i> - <i>Sketch The Person (yourself)</i> - <i>Represent yourself somehow (or anonymous drawing)</i> 	Participants suggest adding flexible or stimulating features
Facilitation (Case study 2)	<p>[Provide more instructions / Indications for use]</p> <ul style="list-style-type: none"> - <i>Different emoji charts for age groups</i> - <i>More suitable for older children and different abilities- Sad face > indicate what makes them feel sad</i> - <i>Help young children understand</i> - <i>Happy face > indicate what works well in meeting</i> 	Participants suggest indications for use
	<p>[Remove unnecessary features]</p> <ul style="list-style-type: none"> - <i>Do we need flow map?</i> 	Participants suggest removing features to improve instructions
Application (Case study 3)	<p>[Provide different instructions - wording]</p> <p><u>Catchy headline</u></p> <ul style="list-style-type: none"> - <i>Title: What + Where you want to share</i> <ul style="list-style-type: none"> • <i>- Date + Location</i> - <i>Invite to summarise story means in a catchy headline</i> - <i>Appropriate word for the organisation</i> - <i>Quality outcomes</i> 	Participants suggest changing the wording to make the words more appropriate and catchier for their organisation

	<p><i>Making the word more general or specific</i></p> <ul style="list-style-type: none"> - Event > Project (Sounds more general > could be a task or event) - Team sheet' > Team Tasks (more specific) 	
	<p>[Change communication style and uses]</p> <ul style="list-style-type: none"> - More use of emojis. i.e. visual - Idea to use at the beginning of an event (...) - It allows us to continue to improve ie we might not get it right the first time' The AND: is for us to get feedback on what we tried' 	Participants suggest changes in the features to make more appropriate for their organisation

As shown in the table above, improvement suggestions involve **providing more instructions on how the tool should work, indications of use, and adding, removing or changing** features to make the communication more appropriate for an organisation and audience.

Evaluating and reflecting on the improvement of instructions

The interpretations of the cross-case analysis suggest that participants evaluated tool improvements in similar ways, but each case study has presented its specificities in the process as shown below.

Table 28. Evaluating and reflecting on which suggestions improve instructions

	Categories	Description
Design (Case study 1)	<p>[Clear design concept and instructions]</p> <ul style="list-style-type: none"> - so when we first worked with instruction, it needs more of work and visual design, and instruction for users, and the concept here comes back to this steps, because of a lot of 	Instructions are improved by providing a clear design concept and instructions
	<p>[More flexibility on personal understanding and how to use the tool]</p> <ul style="list-style-type: none"> - More flexibility in (1) personal understanding + (2) of how to use tool [rigidity can be reduced slightly and/or include extra 'non' defined section - Part of the critique was that I needed more flexibility on personal understanding of how the tool is used, or personal understanding of it, but specifically how this tool is used. - Prescriptive for us service users 	Instructions are improved by giving more flexibility in understanding and use
Facilitation (Case study 2)	<p>[Indication of uses for different audiences]</p> <ul style="list-style-type: none"> - Good ideas to consider different age groups – suitability for younger / older children - I thought we did some good ideas to consider different age groups, and it was suitable for some young and older children, but I think the emojis will probably need a couple of re-digging a little bit. 	Instructions are improved by giving clear indications of uses for different audiences
	<p>[Use it first to make changes in the tool]</p> <ul style="list-style-type: none"> - Would like to use it & make changes - Use it in our own organisations to feed into ICC's - We really liked it, we think is something that we'd like to use it to make changes because we don't necessarily doing it at the moment. We could use it on our own organisations and also use it within the ICCs to sort of measure the engagement process we are doing, and the impact that is having 	Participants highlights the need to use first in order to change
Application (Case study 3)	<p>[Provide more user friendly, understandable, and appropriate words for their organisation and for the community they engage with]</p> <ul style="list-style-type: none"> - 'We looked at the words, and for our organisation, changing the words makes more user friendly and understandable for a wider audience.' 	Instructions are improved by providing more friendly and appropriate words

	<p>- 'We also felt that it'd be really good to put around or related to the organisation outcome, so having a box in the bottom, rather than saying indicators or measures it would be quality outcomes (...)'</p> <p>- Keep the language plain and simple, I acknowledge in that everyone has a voice and it's valued, and everybody needs to be involved. So they can obviously input in various sections of the plans equals forward.</p> <p>- We did the first bit and our work is actually 5 star, we think the language, the words on it are not helpful. I know our trust we use we said and we did from friends and family, but we looked at it say things you suggested because you saying 'you said we did' implies everyone someone says something, we are going to do something different, it also implies when someone say something we completely understand what they are trying to say, and we interpreted, and the way we interpreted, we must be right. So, we changed the wording to 'You suggested and we tried', because that really fits into quality improvement tackle.</p>	
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As shown in the table above, instructions are improved by providing **clear visual designs and instructions, indications of uses, and friendly and clearer words** for practitioners' practice. These findings are related with PD tool concepts, in which tools should 'speak' a familiar language of those who use them (3.2.3) as well as with HCD and OD (3.3.1 and 3.3.3).

7.4.2 How do practitioners improve tools using the **functionality dimension?**

	FUNCTIONALITY	
DESIGN		
FACILITATION		
APPLICATION		

This section presents the synthesis of the analysis in each of the three workshop phases as follows.

REVIEW the functionality of tools

The interpretations of the cross-case analysis suggest that participants critiqued tools in similar ways, but each case study has presented its specificities in the process as shown below.

Table 29. Highlighting functionality issues

	Categories	Description
Design (Case study 1)	[Inappropriate design concepts] <ul style="list-style-type: none"> - The analogy of bricks don't work – They are external - Building may not look like this Purple – designer has coloured the view of building - The layout might be overwhelming chaotic - Seems one step removed - Buildings need to be experienced directly - Design to have most important notes at centre? But group dynamics suggest that people input most important parts at random locations - People live relationally in this space – Too abstract 	Participants highlight unrealistic, impractical or inappropriate design concepts in the tool.
	[Lack of clarity] <ul style="list-style-type: none"> - Give overview of tools - Some steps are confusing - Provide instruction on when/how long to use tools - No clearly defined roles for individuals 	Participants highlight lack of clarity in the design concept and instructions.
Facilitation (Case study 2)	[Inappropriate design concept] <ul style="list-style-type: none"> - Could we use actual people as flow customer cards? 	Participants highlight Unrealistic design concept in the tool.

	<p>[Lack of clarity]</p> <ul style="list-style-type: none"> - <i>Wording at the top quite small</i> - <i>Lack of guidance on use</i> 	Participants highlight lack of clarity in the practical guidance and instructions.
	<p>[Restrictive aspects]</p> <ul style="list-style-type: none"> - <i>More pictures - less writing</i> - <i>Needs to include All ages / abilities / gender</i> - <i>Sexual orientation</i> 	Participants highlight restrictive aspects of the tool that limit its application
Application (Case study 3)	<p>[Inappropriate design concept]</p> <ul style="list-style-type: none"> - <i>Speech bubble instead of square (too angular)</i> - <i>This should exactly look like (arrows to tool/guidelines sheet)</i> 	Participants highlight inappropriate visual communication in the tool, such as shapes, colour contrast and association
	<p>[Lack of clarity]</p> <ul style="list-style-type: none"> - <i>Please provide feedback here Not appropriate for us</i> - <i>Change to expected outcomes</i> 	Participants highlight language issues that are not appropriate for their organisation and audience.
	<p>[Restrictive aspects]</p> <ul style="list-style-type: none"> - <i>Use electronically</i> 	Participants highlight restrictive aspects in the format

As shown in the table above, participants' critiques involve highlighting the **lack of clarity**, **inappropriate design concepts**, and **restrictive aspects** of the tool.

IMPROVE the functionality of tools

The interpretations of the cross-case analysis suggest that participants improve tools in similar ways, but each case has presented its specificities in the process as shown below.

Table 30. Improving the functionality of the tools

	Categories	Description
Design (Case study 1)	<p>[Add resources or changing the type of interactions]</p> <ul style="list-style-type: none"> - <i>Draw the map collaboratively – of the space</i> - <i>Think about how to share 'flow customer map' across other services</i> - <i>TEMPLATE of people in the space</i> - <i>Take picture with a comment area to build feelings + expression about place</i> - <i>And participants are drawing connections themselves</i> 	Participants suggest adding resources or changing the type of interactions to improve functionality
	<p>[Provide more instructions - prime exercises]</p> <ul style="list-style-type: none"> - <i>Giving a clear indication about each step</i> - <i>Extra clear verbal + Oral introduction // explanation for tools (E.g. Circular // Central for reason of)</i> - <i>Assume different roles to build shared understanding</i> - <i>Prime exercise w/ various activities</i> - <i>Or Brainstorm w/group</i> 	Participants suggest providing practical guidance at the beginning of an activity to enhance shared understanding
Facilitation (Case study 2)	<p>[Add resources or changing the type of interactions]</p> <ul style="list-style-type: none"> - <i>Add pics of pregnant lady</i> - <i>More pictures - less writing</i> - <i>Teenage appropriate / younger person appropriate</i> - <i>Broken down - bullet points - less wordy</i> 	Participants suggest adding resources or changing the type of interactions to

	- <i>Could have some blank stickers to write their own emojis / symbols</i>	improve functionality
	[Provide more instructions - Guiding participants] - <i>Give the CYP (children + young people) some guidance on how to fill in</i> - Need instruction to make sure you have a specific focus on when you start the process - Flow = add Gaps in service	Participants suggest providing practical guidance during an activity
Application (Case study 3)	[Change the visual design] - <i>Make the instructions bigger – better use of space</i> - <i>Black text on the orange</i> - <i>A speech bubble implies we’re willing to have a conversation = more people-oriented, more personal/friendly</i> - <i>Could you tick urgent or not? Rather than shade it? It is either urgent or not there aren’t degrees of urgency</i> - <i>Ability to use/electronically ie. As people may not be able to attend meetings</i>	Participants suggest changing the graphic design to improve functionality
	[Provide more instructions - Additional captions / headings] - <i>Include task in each box</i> - <i>Introduce a title on individual sheet</i> - <i>Remove notes + Include comments + challenges</i>	Participants suggest providing more instructions at the tool by adding new captions and headings

As shown in the table above, improvement suggestions involve **adding resources or changing the type of interactions / visual design** and **providing more practical guidance at the introduction and guidance during an engagement activity**. These improvement suggestions are related with the ideas of Mark Tassoul (2009) and Norman (2013). Tassoul highlights in his book that a facilitator should provide introduction and guidance during the process, and these are covered in different cases: interaction models and resources produced by facilitators. HCD principles such as better affordance, signifiers, and conceptual model are also evidenced in the participants’ suggestions for improvement.

Evaluating and reflecting on the improvement of the functionality of tools

The interpretations of the cross-case analysis suggest that participants evaluated tool improvements in similar ways, but each case study has presented its specificities in the process as shown below.

Table 31. Evaluating and reflecting on which suggestions improve the functionality of tools

	Categories	Description
Design (Case study 1)	[New ideas to address the challenge] - <i>it’s design-wise is intuitive, attractive or doesn’t really work, that you stick these and this, it does really make sense but there is really nice ideas about how to address that, like collaboratively making this map, I thought it is really a nice idea of the space, doing stuff like, in the actual space, having templates for people can a, have comment areas, make pictures like this, and they are really nice ideas, or there.</i>	Functionality is improved by providing new ideas to address a challenge.
	[Additional information to improve the usability of tools] - <i>Explanations to improve the usability of tools, like specific things like how, how long, who, why, etc. None of them were on the explanation sheets</i>	Functionality is improved by providing additional instructions to

Table 32. Evaluating and reflecting on suggestions for improving the functionality of tools

	Categories	Description
Design (Case study 1)	[Restrictive aspects] <ul style="list-style-type: none"> - Doesn't take into account non-human actors / Too-human centred - Time based customer flow within a shared space / to experience difficult roles and extend empathy - Too happy - Could also be used to communicate within / across organisations (not just general community) 	Participants highlight restrictive aspects of the tool that limit practitioners' creativity, understanding, and use.
Facilitation (Case study 2)	[Examples of different uses] <ul style="list-style-type: none"> - Each area present update on Snapshot - Bring to meeting and complete quickly on day to present at ICC - Can be used in meetings – Update on What's happening in services - Staff can use to give feedback – link to CQC framework / KPI's link to data figures 	Participants suggest different uses to test the flexibility of the tool.
Application (Case study 3)	[Examples of different uses] <ul style="list-style-type: none"> - Meeting / Training icebreaker, Memory chart – Dementia ward, Memory game – Pictures - Make it bigger! 	
	[Restrictive aspects] <ul style="list-style-type: none"> - White on orange background is hard to read - All existing text would need to change - (Crossed-out text) 	Participants highlight restrictive aspects of the tool that limit unexpected uses.

As shown in the table above, participants' examination involves highlighting the **restrictive aspects** of the tool and **suggestions of different uses**.

IMPROVE the flexibility of tools

The interpretations of the cross-case analysis suggest that participants improve tools in similar ways, but each case study has presented its specificities in the process as shown below.

Table 33. Improving the flexibility of the tools

	Categories	Description
Design (Case study 1)	[Provide editable headings] <ul style="list-style-type: none"> - Provide sticker to change 3 headings to use it for other's idea collection 	Participants suggest providing editable headings
	[Provide more instructions] <ul style="list-style-type: none"> - Add time or other constraints to contextualise the tool 	Participants suggest providing more instructions to contextualise a tool
	[Add or extend features] <ul style="list-style-type: none"> - Have figures / Caricatures of non-human stuff - Different moods of people – Too happy - Create digital version of tool 	Participants suggest adding or extending features
Facilitation (Case study 2)	[Simplify or remove unnecessary features] <ul style="list-style-type: none"> - Simplify Flow map so it is a lot more generic - We would not need to use customer cards as we could get general overview from map, that was a visual aid for everyone 	Participants suggest simplifying or removing unnecessary features

	[Set and share activities in groups] <i>- Setting a new activity with a group</i> <i>- Share information with others as to the approach that works</i>	Participants suggest designing activities as a group
Application (Case study 3)	[Provide editable headings] <i>- Change Words to allow tool to be used in a different way</i>	Participants suggest providing editable headings
	[Provide different formats] <i>- Paper copies – Hard copies</i> <i>- Could it be used in video format?</i>	Participants suggest providing different formats
	[Add or extend features] <i>- Have blank yellow 'Response' cards for extra info</i> <i>- Additional box to share any difference in learning</i>	Participants suggest adding or extending features

As shown in the table above, improvement suggestions involve **simplifying / removing and adding / extending features, providing editable headings, formats and instructions, and designing activities as a group.**

Evaluating and reflecting on the improvement of the flexibility of tools

The interpretations of the cross-case analysis suggest that participants evaluated tool improvements in similar ways, but each case study has presented its specificities in the process as shown below.

Table 34. Evaluating and reflecting on which suggestions improve the flexibility of tools

	Categories	Description
Design (Case study 1)	[Provide ideas that give practitioners more control and flexibility in understanding] <i>- Underestimate creativity of service users</i> <i>- Needs to give users more control. In terms of resilience, users having more control of the whole thing, as opposed of this template</i> <i>- And people have their own ideas, why the colour is purple. So, I think you have to give more space, for people to think about the space.</i> <i>- Understanding of all aspects of tool required to get most benefit out of it</i> <i>- Extended + Deeper levels of design exercise. E.g. Extending empathy</i>	Flexibility is improved by providing ideas that give practitioners more control over the tool, providing flexibility in understanding and use , such as different formats, and additional exercises to extend empathy and understanding in the engagement process
	[Expand applications] <i>- Could be tool for intersectoral communication + not just one way communication strategy development</i>	Flexibility is improved by extending uses for a wider application of the tool.
Facilitation (Case study 2)	[Discuss, discover and suggest creative activities as a group] <i>- I like that for engaging with YP in a 1 to 1 or even in a group. I really like that, and I would like that my staff to use with YP to get, you know like. If a child is struggling with attending school, you can say: right, let's do this activity, what a day is like for you (yea yea), and they could really unpick that (yea yea)</i> <i>- But you could also use it with a group of YP say: we've got this group, what do you wanna do for the next 6 weeks? And come up with a storyboard plan, they might like to do CSC (...), healthy eating one week, do cooking sessions.</i> <i>- Different ways to use emoji cards I saw some good ideas about kind of re-digging it for like a day in my life,</i>	Flexibility is improved by building understanding through designing creative activities as a group

	<p><i>a day in school, and some different ways to use the emoji cards.</i></p> <p><i>- It was again quite looking at our perspective that you've done a consultation with a group of YP or adults or whatever found a gap in service, you come up with a project, and this is a good way to presenting that evidence to things like your managers to ICCs</i></p> <p><i>- It was interesting how different groups saw it differently.</i></p>	
	<p>[Simplify use, make it easy and generic]</p> <p><i>- Use either one or other. Map or card generally like process</i></p> <p><i>- Suggested you could use either one or the other, either the map or the actual flow cards to make it easy and more generic.</i></p>	<p>Flexibility is improved by simplifying the tool, and making it generic</p>
<p>Application (Case study 3)</p>	<p>[Add adaptable captions to make tools more flexible to many situations]</p> <p><i>- Add a name and date on the second half it says, and have a blank yellow response card for any other information people can add in. We felt that it was a good idea as well.</i></p> <p><i>- so we put that box around 'what's new', so we are actually what is new is we continue to communicate in an effective way</i></p> <p><i>- It's a bit like tailor to your audience, I think this is gonna be conversations around, it's not just I'm gonna, it's not making that environment and everyone on board of it,</i></p>	<p>Flexibility is improved by adding appropriate captions to enable wider application of the tool.</p>

As shown in the table above, flexibility of tools is improved by **simplifying, adding and extending features to enable a wider application of a tool**, and **providing ideas that give practitioners more flexibility in understanding and use or generating ideas together as a group to build understanding in employing tools in creative activities**. These findings are related with the flexibility ideas on personalisation and adaptability proposed by Kristina Hooper (3.3.1)

7.4.4 Cross-case summary and conclusions

A similar result was obtained over multiple cases in some phases, but due to predictably different circumstances in practice, theoretical and literal replications have been accomplished. This multiple-study has, therefore, pattern-matched the with the three predicted outcomes and also used a replication logic across the cases in a conceptual sense, not a literal one (literal replication). A summary of each design proposition (instruction, functionality, and flexibility) is presented in the following paragraphs.

To improve the instructions of tools, practitioners highlight the lack of clarity, language issues and restrictive aspects in the instructions, and then suggest improvements on how the tool should work, indications of use, and adding, removing or changing the features to make the communication more appropriate for an organisation and audience. The improvement of tools involves providing clear visual design and instructions, indications of use, and friendly and clearer words for their practice.

To improve the functionality of tools, practitioners highlight the lack of clarity, inappropriate design concepts, and restrictive aspects of the tool, and then suggest improvements by adding resources or changing the type of interactions / visual design and providing more practical guidance at the introduction and guidance during an engagement activity. The improvement of tools involves providing new ideas to address a challenge, adding or

removing features to expand tool applications, clear and friendly graphic design and additional guidance and instructions to enhance the engagement of participants and practitioners in an activity.

To improve the flexibility of tools, practitioners highlight the restrictive aspects of the tool and suggest of different uses, and then propose improvements by simplifying / removing and adding / extending features, providing editable headings, formats and instructions, and designing activities as a group. The improvement of tools involves enabling wider tool applications through different features, providing ideas that give practitioners more flexibility in understanding and use or generating ideas together as a group, in order to build understanding on employing tools in creative activities.

The following diagram summarises the case studies findings, describing the responses of the second analytical level on how the improvement of the tools developed their engagement practices (7.1.4, 7.2.4, 7.3.4), the activities done in the workshop (7.1.1, 7.2.1, 7.3.1), how participants responded to the activities (7.1.2, 7.2.2, 7.3.2), and the answers for the **protocol questions posed to the researcher (5.5.3)** that reflect on the main research question: **How can knowledge exchange tools be improved?** The developed Improvement Matrix framework below summarises the cross-case and within-case synthesis and conclusions. The following section describes the reviewing process of the outcomes of the research with experts in order to boost the overall quality of this study, providing insights into the framework limitations, future applications and development, which are further reflected on in the concluding section.

Improvement Matrix framework

Research question

How can tools for knowledge exchange be improved?

How do practitioners improve tools using the instruction dimension?

Practitioners highlight the lack of clarity, language issues and restrictive aspects in the instructions, and then suggest improvements on how the tool should work, indications of use, and through adding, removing or changing the features to make the communication more appropriate for an organisation and audience. The improvement of tools involves providing clear visual design and instructions, indications of use, and friendly and clearer words for practitioners' practice.

Dimensions Layers	INSTRUCTIONS
<p>DESIGN Designers' practice</p> <p>Practitioners improve tools by providing more open and flexible design concepts that give KE designers more control over the engagement process and also flexibility in using and understanding tools. Improving tools through the design layer of practice involves extending features, providing more instructions, new ideas to address challenges in order to give more flexibility to practitioners.</p>	<p>Challenge / Briefing</p> <p>Activity: Designers look at the briefing that instructs practitioners on how the tool can address engagement challenges, and then suggest improvements to the way the tool could be used to solve a contextual challenge.</p> <p>How? Designers will evidence the lack of clarity in the instructions and restrictive aspects of the tool, and then generate ideas on how to improve the instructions such as:</p> <ul style="list-style-type: none"> • Additional instructions and examples to inspire different uses and to show how the tool might work. • Additional features to stimulate discussions or to enable a more open and flexible system <p>How does this component improve KE design practice? By improving this component, a tool is improved so as to have a clear design concept and instructions, and enable more flexibility in personal understanding, and on how to use tools in practice.</p>
<p>FACILITATION Facilitators' practice</p> <p>Practitioners improve tools by helping facilitators to design engagement approaches and providing indications of use and practical guidance to participants on how complete tools throughout a KE activity. Improving tools through the design layer of practice involves providing indications of uses for different audiences, practical guidance using a tool, additional features that are appropriate to a wider audience, and setting and sharing activities as a group.</p>	<p>Facilitator notes</p> <p>Activity: Facilitators look at the guidelines on how to use a tool to support them to enable participants to creatively engage in a KE activity, and then suggest ideas to improve these guidelines.</p> <p>How? Facilitators will evidence the lack of clarity of the tool, and then suggest ideas to improve the instructions such as:</p> <ul style="list-style-type: none"> • Indications of use of the resources for different audiences • Deletion of unnecessary resources or instructions <p>How does this component improve KE design practice? By improving this component, a tool can indicate uses of the resources that are suitable for different audiences or that need a more specific design.</p>
<p>APPLICATION Engagement experts' practice</p> <p>Practitioners improve tools by tailoring them to suit their community needs and practice. Improving tools through the application layer of practice involves changing the visual and written communication and providing flexible features and formats in order to make them more appropriate to their organisation and communities they work with.</p>	<p>Example or use notes</p> <p>Activity: Experts will look at the wording of a tool, and then suggest appropriate written communication to improve participants' understanding and engagement in an activity.</p> <p>How? Experts will evidence the lack of clarity and inappropriate wording on a tool, and suggest new wording in the tool to instruct participants such as:</p> <ul style="list-style-type: none"> • New wording: Catchy headlines, actual words used in the process, general or specific words, straightforward words • Change communication style and uses: Fewer words and additional words <p>How does this component improve KE design practice? By improving this component, a new wording makes a tool more user-friendly and appropriate for an organisation, and wider or specific audiences.</p>

How do practitioners improve tools using the functionality dimension improve tools?

Practitioners highlight the lack of clarity, inappropriate design concepts, and restrictive aspects of the tool, and then suggest improvements by adding resources or changing the type of interactions / visual design and providing more practical guidance at the introduction and guidance during an engagement activity. The improvement of tools involves providing new ideas to address a challenge, adding or removing features to expand tool applications, clear and friendly graphic design and additional guidance and instructions to enhance the engagement of participants and practitioners in an activity.

How do practitioners improve tools using the flexibility dimension?

Practitioners highlight the restrictive aspects of the tool and suggestions of different uses, and then suggest improvements by simplifying / removing and adding / extending features, providing editable headings, formats and instructions, and designing activities as a group. The improvement of tools involves enabling wider tool applications through different features, and providing ideas that give practitioners more flexibility in understanding and use or generating ideas together as a group in order to build understanding in employing tools in creative activities.

FUNCTIONALITY	FLEXIBILITY
<p>Interaction models</p> <p>Activity: Designers look at how the tool design concept addresses an engagement challenge, and then suggest ideas to improve the interactions required to enable creativity in a group of participants.</p> <p>How? Designers will evidence the unclear instructions, and the impractical, unrealistic and inappropriate design concepts, and then generate ideas on how to improve the concept such as:</p> <ul style="list-style-type: none"> • Different resources to creatively and collaboratively address an engagement challenge • Additional guidance (e.g. prime exercises or roles) <p>How does this component improve KE design practice? By improving this component, designers can provide new tool ideas and features on how to collaboratively address an engagement challenge and also improve the usability of the tool.</p>	<p>(Build) Resilience</p> <p>Activity: Designers look at how the tool design concept accommodates unforeseen applications, and then suggest ideas to improve the resilience of the tool.</p> <p>How? Designers will evidence restrictive aspects of the tool, and suggest ideas to improve the flexibility such as:</p> <ul style="list-style-type: none"> • Editable content (e.g. electronic format) • Extended features • Additional information to contextualise the tool (e.g. time duration) <p>How does this component improve KE design practice? By improving this component, designers can expand applications of the tool and provide ideas that give users more control and flexibility in understanding and use, providing practitioners more space to think about their engagement challenges.</p>
<p>Resources produced for facilitators</p> <p>Activity: Facilitators look at how the resources can support creative abilities among individuals in engagement activities, and then suggest improvements on how to better use resources to guide participants to achieve an agreed objective.</p> <p>How? Facilitators will evidence the lack of clarity and restrictive aspects of the tools, and then suggest ideas to improve facilitation such as:</p> <ul style="list-style-type: none"> • Practical guidance on how to engage participants through the process • Different interactions that are appropriate to a wider audience (e.g. different inputs) <p>How does this component improve KE design practice? By improving this component, the addition of new resources and further guidance to a tool can improve the action of engaging with participants in an activity.</p>	<p>(Encourage) Facilitator response</p> <p>Activity: Facilitators look at how the tool can accommodate different approaches to facilitation, and then suggest improvements on ways they could enable creative exchange in multiple situations using the tool.</p> <p>How? Facilitators will evidence different ways to facilitate an activity, and suggest ideas on how to improve the flexibility such as:</p> <ul style="list-style-type: none"> • Setting a new activity with a group • Sharing approaches that work <p>How does this component improve KE design practice? This component can improve the facilitation practice by simplifying the tool, discovering and discussing how to apply the tool in different activities, suggesting creative ways to use the resources.</p>
<p>Design of material</p> <p>Activity: Experts will look at visual communication and elements of the tool, and then suggest improvements on how the graphic design is presented to participants of an activity.</p> <p>How? Experts will evidence the inappropriate and restrict graphic elements of the tool (features, appearance, format, and images), and suggest improvements to the visual communication such as:</p> <ul style="list-style-type: none"> • Different visual design • Additional captions / headings <p>How does this component improve KE design practice? By improving this component, a tool provides additional features to expand applications, and a more clear and friendly graphic communication and documentation, supporting and enhancing practitioners' engagement practice.</p>	<p>(Enable) Contrary activity</p> <p>Activity: Experts will look at how a tool encourages unexpected uses by participants, and then suggest improvements to the design in order to support different responses from participants.</p> <p>How? Experts will evidence the restrictions to unexpected uses and different applications, and suggest improvements to the flexibility such as:</p> <ul style="list-style-type: none"> • Additional flexible features • Different formats • Editable content <p>How does this component improve KE design practice? By improving this component, a tool provides more appropriate and catchier captions and graphic communication, making a tool more adaptable to many situations and easier for individuals to assimilate the information in the tool.</p>

8. Sharing case studies conclusions: Reviewing the Improvement Matrix framework

As described in Section 5.5.4, this chapter focuses on evaluating the developed improvement framework and the outcomes of the research with academic peers – who work with groups of non-designers and design researchers specialised in participatory approaches and tools – to give critical feedback on the framework through expert validation sessions. This chapter describes the review process (8.1), a summary of the expert discussions (8.2) and the framework further development (8.3).

8.1 Case studies review procedures

The researcher exploited the possibilities of the European Academy of Design conference 2019, and invited participants with the support of a simple and appealing A3-sized folded handout containing the research question, methodology, insights, and overall improvement matrix framework, as shown below.

How to run better workshops?

Turn over this leaflet to see the Insights into the Improvement Matrix layers, dimensions and components.

1. Workshop duration – as 1.5-hour workshops can be delivered at the expense of a better outcome. Bearing in mind that a longer time to reflect and evaluate the improvement proposals is required at the end of the workshop.

2. Clarity – Facilitators have to provide clear guidance, examples and remind participants about the objective of improving KE practices in order to engage in the process.

3. Participants – The participants' roles and experience, and the number of participants in the workshop might affect the outcome of the process.

4. Learning through the process – After finishing the first task, participants can conclude the next round faster than the previous round.

5. Formats – Participants should be able to look across the proposals to learn through testing proposals. The design of material and the facilitation actions should support the process towards a desired outcome.

Layers, dimensions and components

Insights into facilitating improvement workshops

How to run better workshops?

Improvement Matrix framework draft
See Appendix Q

Improvement matrix

Dimensions Layers	INSTRUCTION	FUNCTION	FLEXIBILITY
DESIGN	Challenge / Briefing	Interaction models	Appropriation
FACILITATION	Facilitator notes	Resources produced for facilitators	(Encourage) Facilitator responses
APPLICATION	Wordings	Design of material	(Enable) Versatility

How to run better workshops?

Improvement plan (participants as co-researchers)

AIM
Tools, objectives (Shared concern), structure, physical space-time

Round 1 - Improving Instructions
• Challenge / Briefing
• Facilitator notes
• Example or use notes

Move to the next tabletool

Round 2 - Improving Functions
• Interaction models
• Resources produced for facilitators
• Design of material

Move to the next tabletool

Round 3 - Improving Flexibility
• (Build) Resilience
• (Encourage) Facilitator responses
• (Enable) Subversion

Move to the initial tabletool

Test ideas (Before-and-after design)
Task: Review and rate the proposals
Provide an evaluation sheet to help participants to rate and discuss the proposed ideas in previous tasks.

What actions are warranted?
Each group summarise their learning from testing and present their findings. Then, the whole group decide what proposals lead to improvement, on the basis of the learning from the test.

RQ: How Can Tools for Knowledge Exchange be improved?

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Figure 58. A3-sized case study report (See Appendix Q)

The review process aimed at communicating case study findings to corroborate with the views of experts in participatory design approaches and tools, as the intended audiences (Patton, 2015) of the Improvement Matrix framework. It generated further evidence, gaining a wider perspective of the research contribution, and identifying implications of implementation of the framework in practice, areas for improvement and future developments.

In this expert review, the researcher provided the participation information sheet and consent form (Appendix M and N) before the start of the study, and written informed consent was obtained from all participants of this study. The researcher conducted five discussions via Skype calls and at the ImaginationLancaster between April and May 2019, where he asked five questions during a discussion that lasted between 40 to 55 minutes. These conversations were audio recorded for further analysis and refinement of the improvement framework. The researcher prompted participants to question the soundness and the validity of the research (Yin, 2018) using appealing graphic material (Figure 58) and/or slides presentation (Figure 59).

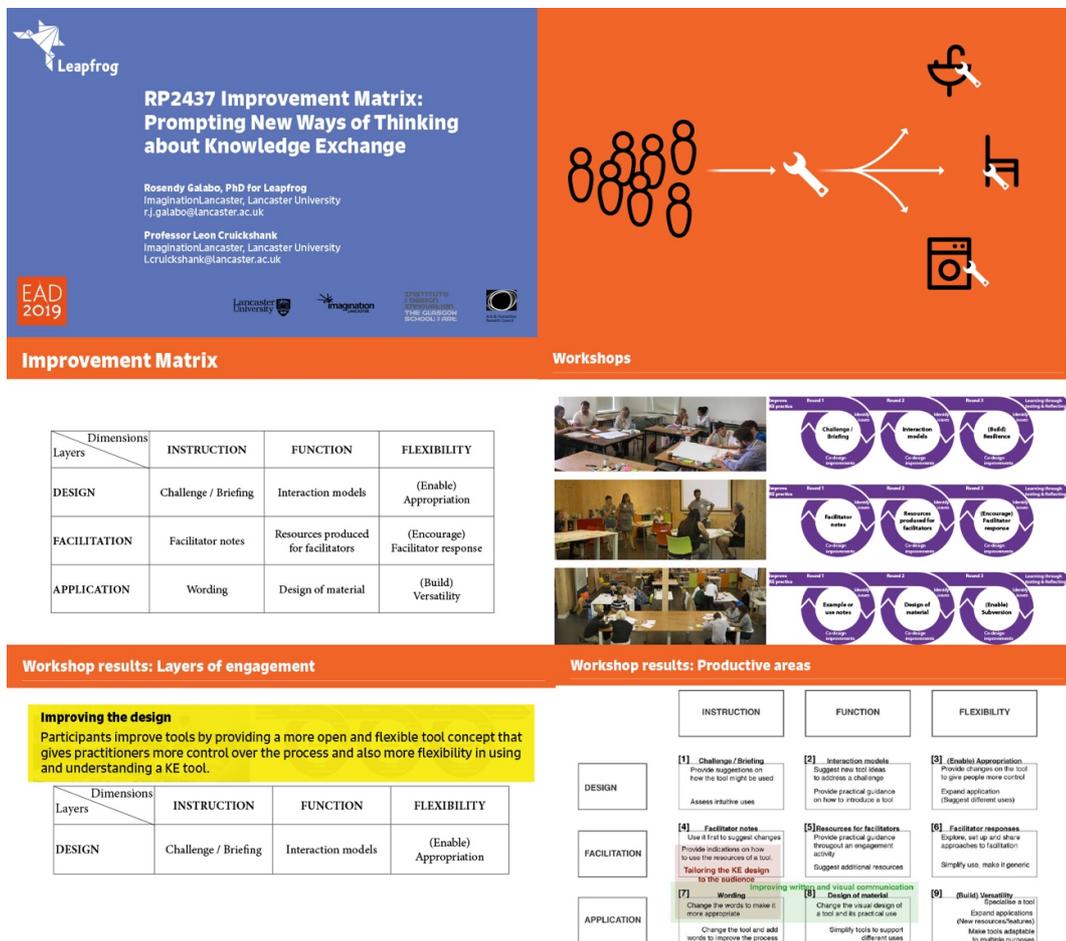


Figure 59. Presentation slides example

The questions were posed in a way that experts in participatory design approaches and tools (5.5.4) could judge the quality of the action research (5.5.1), and the pragmatic, transferability, evocativeness, and participatory qualities of the framework developed in this thesis. That is, the questions prompted participants to talk about the practicalities of the framework, and also further developments. The following questions were posed to prompt discussion:

1. How relevant is the research I just presented you with?
2. Does this framework introduce new perspectives for you?
3. Is this framework useful for what you do?
4. How might you apply this framework?
5. What are the limitations of the framework?
6. What further developments would you suggest to improve the framework?

The following subsections present the background of participants and the findings of this case study review.

8.1.1 Participants of the case study review

A case study review includes audience reactions to the improvement matrix framework, where draft findings were presented ‘to multiple audiences to learn how they react, what they focus on, what is clear and unclear’ (Patton, 2015, p.670). In this case study review, the researcher reviewed the improvement matrix with five participants with different backgrounds described as follows:

1. The first reviewer has a Bachelor’s degree in Industrial Design, a Masters in Design with focus on architecture and urbanism and is currently studying for her PhD in design at the School of Architecture in the Royal College of Art in London. In her previous investigation, she worked with one organisation from the largest complex of favelas named Complexo da Maré (Brazil), where she tried to understand the relationship between the organisation and the residents in terms of engagement, and how people would respond to this organisation. She had an opportunity to run workshops with them to understand what kind of methodologies could work out in this relationship, and tried a mix of design thinking, human-centred design, participatory design, and design anthropology. The workshops she delivered to these groups of people involved, for example, developing furniture for one cultural centre or exploring activities of dialogues, which she considers as tools, and not only physical tools per se.
2. The second reviewer has a background in fine art and started his career as a graphic designer, before becoming involved in project management, knowledge management and tools. He spent most of his professional career around knowledge exchange and tools, an area in which he became a senior person who brings change to how the knowledge is managed. He has adapted and used extensively tools that are familiar to management schools, such as tools for mapping out customers, marketplace and business competitors.
3. The third reviewer is a computer scientist with a background in human-computer interaction and is a lecturer at the University of Dundee. Apart from doing PhD and Masters supervision and administrative tasks, he has run workshops over the last two years to understand the challenges people face when they are creating digital services based on what they are doing. He used a similar workshop framework when talking with schoolchildren, starting off the workshops using similar research techniques and worksheets, where he changed to more fundamental and less detailed information.
4. The fourth reviewer is a designer strategist working for a technology gateway in an Institute of Technology in Ireland. Her organisation owns fifteen gateways over eleven Institutes of Technology, in which these gateways are basically retreats to engage with researchers and institutes. The particular gateway she works with is design focused, where most of the projects come in through a design approach. She works with all sorts of different agencies, most of them SMEs, a complete mix of

companies, ranging from single employee turnover to multi-million-turnover companies, such as engineering, coffee shop owners, IT, and buffalo farms. She works with them usually at the early stage of innovation on scoping and framing, and ideation and identifying innovation, moving them to concept and concept creation. Her aim is to help them to understand the process of innovation, to identify innovation, and to help them set on a pathway that they can implement innovation. She designs her approaches around a toolkit that she builds and adapts as they go along, and sometimes she adapts templates from business and other places or she designs tools from scratch depending on her needs.

5. The fifth review is a studio lead / tutor and research associate at Glasgow School of Art Highland campus. His main role is to teach in studio settings, theory and visual mapping, visualisation, workshop, participatory design, knowledge transfer, and everything in between. At the core of his work, he runs workshops all the time and develops bespoke tools for each participatory workshop, depending on the theme or the project or the idea or the needs of each particular workshop, such as worksheets, visualisations, tools for collaborative understanding of complex issues, laser cuts, and artefacts that enable better conversations, communication and understanding through participatory workshops.

8.1.2 Case study review findings

Participant responses were grouped thematically in five themes: (A) new perspectives and relevance to practice, (B) Transferability / applications, (C) Limitations, (D) Further developments, (E) Future research. Each finding is evidenced with some quotations from participants as follows.

(A) NEW PERSPECTIVES AND RELEVANCE TO PRACTICE

All participants have designed and improved tools for their own practice as presented in Section 8.1.1. However, they pointed out that the Improvement Matrix provides a different perspective that relates to what they do, contributing to their knowledge by giving them new insights and/or changing their practice.

“... I’m still looking for an appropriate, what kind of tools could be co-developed with them, rather than I’m saying what they have to do or I’m saying what, like I’m not from the favela you know? So, I want them to look at the tool, and say okay: this is useful to us, this improve our work, or it enhance our capacities. That’s more or less what I’m looking, so yes it relates to my practice because in terms of, especially the part of instructions, functions and flexibility. Because in my own work, so far, I have separated to two areas, which are methods and content. So, what kind of content should be co-developed in terms of tools, and method would be how to articulate these methods with people. But you divided into three forms, which is another perspective for me to understand the instruction function and flexibility.” (P1)

“yea that’s very helpful to understand because, although it’s a bit generic it can also lead to different context” (P1)

“... What is interesting to me I spent so much time, professionally, systematically changing individual tools and workflows and combinations of tools, from a defusing experience perspective. And yet, what is so surprising to me is that I’ve never been systematic in I’ve rarely been systematic in the process I used to modify tools” (P2)

“... What we are doing is changing wording, the design of materials, so they are getting the same thing, but I’m guessing on your framework that would be, the

challenge / briefing, up with instruction and design, and interaction models with function and design. But we are changing the overall workshop so it's more suitable for different audiences, so we are doing the same bits and changing a little bit. So, yeah the stuff you are saying makes complete sense and I think it works well with the things we are trying to do.” (P3)

“... I wouldn't considered laid out like that, but when you explained now. The top three layers, the instruction, function, flexibility actually make sense” (P4)

“... my main thing is I don't necessarily think of it in such discrete sections. I tend to kind of it's been quite intriguing to see it divided out into this way of thinking about what is the design of the tool, what is facilitation. I guess in the way we teach, I teach my students on how to work and create tools, we discuss its purpose, the audience and the intent of the tool, and its usability and I guess then whether is a tool to describe, to link or tool to say retrieve information, like so that how I can teach with my students, the usefulness of these engagement tools. That's how we approach it, so I like seen it in another different way” (P5)

Three participants mentioned that they found the concept of flexibility interesting

“... I found very interesting because I haven't thought about of this notion of flexibility of improving the tool while you are doing your practice. I think that's very useful” (P1)

“... it's the idea of flexibility, and where you fit in this flexibility. From looking at it, the flexibility seems to be this iterative thing, so any time you are looking at how to make anything more flexible, it does kind of feedback to itself to into the other areas, so when you are thinking about your challenge or your briefing, and then you go along and think “Oh ok well, what is the appropriation techniques, what is the facilitator responses you automatically have to go back, to the start again just to double check everything if it doesn't work. I don't know if that's a limitation, but I think it's quite a useful thing Ros to do” (P3)

“... I like that concept of the flexibility of the tool, and being able to allow the tool to be appropriated for future use. So, the tool's life goes beyond say, the life of the workshop that carries on into other workshops (...) So, I like the idea of a tool can live on beyond the usefulness of the you know, of the life of the workshop.” (P5)

One participant mentioned about changing his current practices, and the researcher agreed that the framework enhances the reproducibility in qualitative research as a process of reflection.

“... I think if we are do things the way we currently do, (...) if we arrive on a situation, we don't have materials based on where we are, we just make them up on the spot, and if we do that we can use in research. So, it's good as an activity for the participants and in terms as an activity we can use in our research studies, well that protocol hasn't gone through ethics, so we are not allowed to use it. We don't know how to reliable the data is, because we haven't sat down and came up with a methodology for all these groups together. But if we turn around first, I think makes a lot of sense” (P3)

“... So, you have one tool, and start to think who are the people you are going to engage with, and make it suitable for each audience, instead of going one by one, and you kind of create reproducibility for your research.” (Researcher’s reflection)

(B) Transferability / Applications

By having participants from different design backgrounds, they were able to suggest different applications of the Improvement matrix framework in their practice. Participants suggested that the improvement matrix could be applied as:

- **An empty matrix with prompts to help them to think and talk about a particular knowledge exchange**

“... I sit down and have a blank canvas on to start with, what kind of information I’m extracting, what information am I giving? There you go straight away your first box design and instruction, what information am I given? That’s challenge and briefing. That’s going to prompt me to know that I need to do that, I need to somewhere give the information whether collect information. And you know the function, interaction models okay, how they are physically going to do this? You know is this going to be right in on the top of it, it’s gonna be you know? Add things to stick to it or what is going to happen or how that work, you know? Just those sorts of prompts so I would probably using as a checklist as I’m going through, what I need and like I said if I had few more prompts” (P4)

“... to say perhaps then making it so that maybe they are allowed to fill in the matrix, or suggest these are the ideas we think, but perhaps if you are designing your tool, think these kind of six between layers and dimensions as a way to think about the tool, and think about your own. Because maybe even like a suggestion could be maybe don’t fill in the nine squares, you leave it quite blank, and maybe this is for say the obviously those can be used for community groups.” (P5)

- **A big poster stuck on the wall to populate it with information about participants of the knowledge exchange activity**

“... when you say many people have the knowledge in their heads, to some degree I feel that’s true, it often needs to be brought out through conversation and through activities you might be doing in a day to help populate this, in a very large way. It’s almost standard practice to get that information, visualize on the walls and referred this during the session. One reason it’s standard of practice because it really works, when I have that idea and stick on the wall, then it is still visible three hours later, or tomorrow afternoon. Who are the end users? Yea. They sat in the room, fine, but that’s okay if you have 90 minutes to solve something” (P2)

“... I would even mind having that printed out on kind of a A1 paper stuck on the wall, and put a little bit of post-it notes on itself, as a way to start thinking about all these different areas, and if you start to colour code the post it notes, if you say well red post-it notes demographic, and green post it note demographic, blue post-it note demographic, and then you can start to fill up the thing, and it’s a really quick and easy and visual way to figure out what is you are doing and all the different other things you might be comport as well.” (P4)

- **A teaching aid**

“... I think it would be useful as a teaching aid, and perhaps even just as a visual aid in thinking about how do I make tools how do kind of think through the creation of

these participatory tools, so yes overall it would make a useful addition to the way we talk about making tools.” (P5)

“I can see this framework used as I say as a kind of added in addition to the foundations that we give them, and let’s say a memory aid, right? So it can be something that sits in a class, and we could refer to it, and say you know, if this is this then you can create that, and these kind of 9 approaches to the tool, and depending on different situations you can think about these kind of blocks as a kind of aids to think about tool, and ways to facilitate, not only the creation of the tool but say also the use of the tool and its overall kind of you know impact.” (P5)

(C) Limitations in practice

Participants highlighted some limitations of the framework that were not applicable to their practice or would not be the main focus in their practice or would prevent the application of the framework. These limitations are:

- **Facilitation layer of practice as embedded in other layers of practice or less important in their practice.**

“One thing that it’s still in my mind it’s a doubt, it’s the part of the facilitation. Because from my previous experience, (...) facilitation is the only thing that I still have doubts in my mind, I still question. Because from my previous experience I’ve noticed that I’ve been a facilitator. I’ve always been an actor working with people, they relied on me as the expert as this specialist, even though I put myself in a posture that I am just conducting the experience. So I think for me, maybe it’s not the facilitation itself but the idea that everyone is with their minds on the same page, we are all here together, doing knowledge exchange and tools exchange and I think that sometimes within the context your dealing with, that mindset is not necessarily, I don’t know how to achieve that, you know? Because they don’t really see in the same position as I do, so people in Maré for example, they would see the work as, we are learning how to do woodwork or we are learning how to assemble a new piece of furniture but they would never see as okay we are trying to make a diagnosis of this cultural space and who are the people who use this space, and you know? So facilitation for me was a bit tricky, because I couldn’t see myself as a facilitator, but more as a specialists in the end. That would be my only question about the matrix. (...) When you are talking about multimedia or interaction design or graphic design, the mediation is way less when you talk about, actually transforming the urban space somehow. “ (P1)

“Maybe one thing, I’m more focused on the design element to be honest because the facilitation, the facilitator notes when they come experience will add to this itself as you suggested before. Once you design in a way that allow it to happen in the first place, so it keeps me coming back to the top line, the design three boxes you know. I think, the rest of those if done right, so you know challenge / briefing okay so that’s instruction, function what we’ve got to do, how it’s going to be adapted.” (P4)

- **Time and resources**

“... So, there are limitations about resources, when you are talking about the area of mare. For example, they do a lot of resources or materials they could use, the abandoned materials we have there it’s amazing, but on the other hand they don’t have enough money, they are very limited, (...) they are always applying for these funding, so they can run their projects, so definitely resources would be a problem” (P1)

“... it might begin to this and might not deal with that level and (inaudible) squares. So if there is time for one, if there is only time for one just a conversation, so we got”. (P2)

- **The need for allowing flexibility to enable use in different practices.**

“... But that doesn't invalidate the framework at all, it's just there is a few adaptations, it's a matter of adapting and transforming it a little bit, making it more flexible maybe” (P1)

“... it's for somebody who doesn't really know what they are doing, whose are very caring member of their local church and they want to help their local church or youth group, or something. They would facilitate workshops together, then I feel like the language is way off” (P2)

“... I think what I was saying before is that I would probably allow for some flexibility on the framework or for obviously it can't cover everything. So I think either being specific asked to what it is that's this framework allow” (P5)

(D) Further developments

Participants suggested many ideas to improve the framework to make it useful in the design practice, such as allowing flexibility and changes in wording, describing intended audiences and other additional information to help prompt people to think about improving tools, and suggesting sequencing / processes. Some quotations from participants evidence these suggestions for improving the framework as follows.

- **Allow flexibility and different wording**

“... If it's reworded as I suggested that would be understandable to me and to secondary school child, I think. to make it more understandable” (P2)

“... maybe I suppose it changes for different people and different tools, some prompts underneath the headings would help (...) if I had it right now, I would be adapting myself straight away putting headings that suit me. Is that making any sense?” (P4)

“... People will interpret in different ways, and again is going back to the problem of being not restrictive in the usability. Because if you give too much information in your box you might undermine other surprises that might come otherwise that people might choose to use in a different way. At the same time, if you have an intent of something that you want to extract, you do need to have, some boundaries to get that information.” (P4)

“... So, I think provides me with say something I could maybe adapt, and to maybe the way that the terms are used maybe not the ones I would use (...) keeping it quite simple at least the wording” (P5)

- **Describe intended context audiences**

“... Maybe allow it like a version for one particular type, and other that is quite empty, and one that is quite filled in (...) I suspect, I guess it's more useful for people who have less experience, in make changes in things” (P2)

“So yes, it's good and I think the issue is there are different ways we can look at. You can look at the academic standpoint, and I'm quite like you, my main background was quantitative research and then I moved to qualitative and finished my PhD. So I

like rigour, I really like rigour, and I really like to make sure I'm going to be presenting something, and go be submitting something, and I want the rigour to be perfect. So from a scientific standpoint, it's 'we don't want to be changing stuff in our own studies, but once is given out to other people, I think is really good you give them the opportunity to basically remix it and do whatever they want to do' (P3)

"My one question is this matrix just something that you are using as kind of descriptive form or there is something that say a community, participant can use as well?" (P5)

- **Develop working examples**

"I think it would be useful to have some working examples of it to see how you've used it in your own work to kind of adapt different ideas people come with and present it to different audiences." (P3)

- **Suggestions to improve the framework: Clarity and additional instructions (such as prompts)**

"... If the academics are not really important and what matters are about making a different, than that's to make getting clarity on what kind of context it is we are talking about, and then modify it to that context through repeat and testing. Because having that, I might be literally the case, the kind of meta-level no ever sees only and you supervisor see, and there are two or three flavours of it, that sit underneath there modified and useful with in an appropriate language and stuff in." (P2)

"... The framework would be useful, I'm just looking at with the stuff I have. That would be, even some prompts underneath that to break that down a little bit, and maybe I suppose it changes for different people and different tools, some prompts underneath the headings would help. Bring it more alive as a checklist for me, as a framework Is that make any sense? Because at the time you try to know what that mean for this project, but it really needs prompts break those boxes out and a bit more detail of intent would be helpful." (P4)

"... if it is for say either you know designers who are used to doing these things, it could be useful not even add text in the middle, and say here, have a look about this, and use this as an approach to thinking the relationship of your tools with your workshops. I think maybe not making it so prescribed" (P5)

These applications, suggestions, limitations, are implemented and presented in the following subsection.

(E) Future research

Participants suggest ideas for future research on the topic of knowledge exchange and tools. These suggestions involve testing and refining the framework in practice to develop working examples, and tracking changes of the framework over time.

- **Test the complete framework with local practitioners. This could be through creating a toolkit toward a particular event.**

"So, it's a different approach, because I'm looking in the urban sphere, but I would try to use the dimensions as you said, probably, bringing a few tools that I have from my side, and trying to bring their tools as well, and promote first a conversation about. I think that would be my, intuitively how it would work. And after doing that, we could start coordinating the tools and then finding the best pack" (P1)

“I would be very interested in being around to observe, like a session when you sat down and anyone and any group who work on their own tools with an invested interest, not like the workshop we did, but like a two day session, with the group of NHS people around.” (P2)

“The only thing I would be looking at from using tools myself in that approach is sequencing, so this tool generally speaking is not going to, in my situation, will not standalone. It comes sequentially before or after something else as part of the overall process, because you are not going to do the whole process in one tool. Generally speaking for me anyway, I would probably use five different tools and bring them in a sequence, and so in that case, I would need sequence, where this is, what I’m doing, just to go according or check list or make notes of it, or prompt me to know, what I’m designing for in a sequence.” (P4)

- **Test the complete framework with designers. This could be through creating a process and plugging-in other methods.**

“... Any time I’m doing UX work together with other companies, this is my cheat sheet. I try to figure out what of the part of sort of the double diamond because it’s easy to understand, what parts of the process we are looking at, and the different techniques we know as UX experts work well for these different areas, and then from that, I can plug them in, if that idea of the application stage, and going through things like: Here’s the things that might work. So maybe, it might be worth trying to find out, if you are using this technique, this might match up and leading well with other one.” (P3)

“... So, the next time I’m going to do the workshop, I will be taking the matrix, and sitting down, and think right let’s think about the challenge we have first, so it gives you the steps on what you need to do” (P3)

“... The other important thing you have to look at is the reflection or the outcome or some way of accessing what is being captured then either through reflection or analysis. Is there some way on the sheet on the back can be done or something else we do. The analysis, the reflection or the extraction of the information.” (P4)

- **Track changes over time**

“... It is a very temporal thing, so the framework people come up with on your matrix on day one, it’s going to be completely different from a framework you come up after four months after running things. So, I think it is worth looking at people to think at how changes have happened over time, and why changes happen in this way as well” (P3)

“I’m going through, what I need and like I said if I had few more prompts, probably added, and I would add over time as I’m doing as things come up in practice. Experiential using designing things, I’m sure you naturally start adding those prompts in.” (P4)

Other future research suggested by one participant of the EAD2019 workshop (Galabo and Cruickshank, 2019) involved tracking changes of the improved versions of tools over time to see whether the improved tools were really improvements and how they developed their engagement practices.

8.1.3 Responses to case study review: Refining the Improvement Matrix

Based on the findings of the case studies review, on one side of the handout, the draft improvement matrix (Appendix 13) still stands robust, with minor changes in the content (see page 171-172). On the other side, extra information about its intention, application, limitations, and prompts for each component were added to improve the utility of the framework. This section presents the framework developments performed on the initial A3-sized case study report handout (Figure 60) that was introduced in Section 8.1.1 as follows.

How to run better workshops?

Use the framework as a memory aid to teach students on how to create better engagement tools

Checklist for the design of tools

Think about the tools you need to design to communicate with your audience. Knowledge exchange you are going to do.

Adapt the working of the tool to suit your practice

Populate the framework with information about a series of workshops

Print out the framework on a large format paper and use it to design to communicate with different audiences using coloured sticky notes.

Turn over this leaflet to see the highlights into the Improvement Matrix layers, dimensions and components

How to run better workshops?

Suggestions for use

Teaching aid

Use the framework as a memory aid to teach students on how to create better engagement tools

Populate the framework with information about a series of workshops

Print out the framework on a large format paper and use it to design to communicate with different audiences using coloured sticky notes.

Adapt the working of the tool to suit your practice

Think about the tools you need to design to communicate with your audience. Knowledge exchange you are going to do.

Use the framework as a memory aid to teach students on how to create better engagement tools

Working example: Improve It workshop

In this workshop, participants with genuine interest in getting tangible benefits of improved tools work in partnership with the facilitator to identify issues and understand changes in the tools according to their practices and suggest improvements, make decisions which suggest how to have an engagement process. (See 11th part of the framework) Correspond to one workshop

Workshop instructions

Participants will be given 15 minutes to think about the tools and consider their practices and process in general.

Workshop structure

- 15-25 minutes: **ROUND 1: CHALLENGE AND IDENTIFY PROBLEMS**
- 15-25 minutes: **ROUND 2: CHALLENGE AND IDENTIFY PROBLEMS**
- 15-25 minutes: **ROUND 3: CHALLENGE AND IDENTIFY PROBLEMS**
- 35-45 minutes: **ROUND 4: CHALLENGE AND IDENTIFY PROBLEMS**

Workshop instructions

- Participants will be given 15 minutes to think about the tools and consider their practices and process in general.
- Remember that the other group should be able to understand your handwriting / notes
- After each round, ask participants to do a rotation and move to the next table until they return to their initial station.
- Remainder of participants to stay in the same group until the end of the workshop.

Improvement matrix

Dimensions	INSTRUCTION	FUNCTIONALITY	RELIABILITY
DESIGN	Challenge / Briefing	Interaction models	Build resilience
LAYERS	How can you improve the briefing and interaction models?	How can you improve the resources and interaction models?	How can you improve the design to create approaches to address the objective of engagement is checked?
IMPLEMENTATION	Facilitation	Resources produced by the facilitator	Encourage facilitator responses
APPLICATION	How can you improve the facilitation and resources produced by the facilitator?	How can you improve the resources to enhance the job of facilitating and resources produced by the facilitator?	How can you improve the design to encourage facilitator responses to address the objective of engagement is checked?
ADAPTATION	Example or use notes	Design of material	Enable continuity activity
ADAPTATION	How can you improve working of the tool to be more appropriate for workshop participants?	How can you improve the design of communication to be more clear and identify to workshop participants?	How can you improve the design to enable workshop participants to identify to workshop participants?

Overall Improvement Matrix framework
See page 172-173

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Figure 60. A3-sized refined Improvement Matrix (See Appendix R)

To respond to the need to describe the intended audience, the researcher included additional information on the main side of the handout with instructions about the context as shown below.

The improvement matrix framework

How to run better workshops?

The Improvement Matrix is based on a review of the literature on co-design and participatory design practices, and my experience and background in designing and delivering workshops and tools. This framework aims at improving tools for participation in order to make better creative engagement practices and workshops.

The intended audience of this framework are people who work with groups of non-designers, and design researchers specialised in participatory approaches and tool design.

This framework consists of a matrix with nine components that prompts people to think, discuss and improve tools that are based on three overlapping engagement practices (Design, Facilitation, Application) and three dimensions used for improving tools (Instruction, Functionality, Flexibility).

This framework was designed and tested in collaboration with public sector practitioners in Lancashire, and design practitioners and delegates of the Design Research Society (DRS2018) and European Academy of Design (EAD2019) conferences. This framework was developed as part of larger research project called Leapfrog and Rosendy Galabo's PhD research project called Improve It at Lancaster University.



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Conselho Nacional de Desenvolvimento Científico e Tecnológico

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Figure 61. Framework presentation on the main folded page

On the second folded part, one reviewer suggested adding working example. Therefore, the researcher added the Improve It Project as an example, and designed the material and information inspired by the IDEO design kit (2015) as suggested by another reviewer.

Working example: Improve It workshop

In this workshop, participants with genuine interest in getting tangible benefits of improved tools work in partnership with the facilitator to identify issues and misunderstandings in the tools according to their practices and suggest improvements, and then discuss which suggestions lead to a better engagement process. Each layer of the framework corresponds to one workshop

Duration
90 - 180 minutes

What you will need
Sharpies, scissors, tapes, Post-it notes, Worksheet with questions, and preselected tools

Participants
(6 or more) Designers, community members, partners, engagement practitioners, public sector workers

Seating arrangement
A station composed of a table with 3-2 chairs and designed to enable participants to easily circulate during the workshop.

Workshop instructions

- Remind participants look at the tools, and consider their practice and process in general.
- Encourage participants to scribble and take notes on the tool without being scared of ruining it
- Remember them that the other group should be able to understand your handwriting / notes
- After each round, ask participants to do a rotation and move to the next table until they return to their initial station.
- Remind participants to stay in the same group until the end of the workshop.

30 minutes	15 - 25 minutes	15 - 25 minutes	15 - 25 minutes	15 - 25 minutes	25 - 45 minutes
INTRODUCTION	ROUND 1 - CRITIQUE and SUGGEST IMPROVEMENTS	ROUND 2 - CRITIQUE and SUGGEST IMPROVEMENTS	ROUND 3 - CRITIQUE and SUGGEST IMPROVEMENTS	ROUND 3 - CRITIQUE and SUGGEST IMPROVEMENTS	EVALUATE IDEAS AND REFLECT
Improve KE practice	Round 1	Round 2	Round 3	Round 3	Learning through testing and reflecting



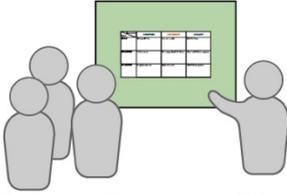
Figure 62. Working example: Improve it

On the third folded part, the researcher added suggestions for use for the framework as transferable / potential applications of the framework, such as using it to map different

demographics, as an empty framework with prompts to think about particular knowledge exchange, as a teaching aid, and also added a suggestion to adapt the wording of the tools before applying in practice as shown below.

Suggestions for use

Teaching aid



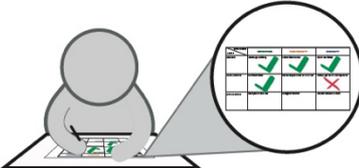
Use the framework as a memory aid to teach students on how to create better engagement tools

Populate the framework with information about a series of workshops

Dimensions Layers	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
DESIGN	Challenge / Briefing <small>DESCRIPTION - Specific challenge Audience</small>	Interaction models <small>Resources</small>	(Build) Resilience <small>How? - Resources</small>
FACILITATION	Facilitator notes <small>DESCRIPTION - Content Audience</small>	Resources produced by facilitator <small>Resources</small>	(Encourage) Facilitator responses <small>Support / Extra DESCRIPTION - Content</small>
APPLICATION	Example or use notes <small>DESCRIPTION - Content Audience</small>	Design of material <small>Resources</small>	(Enable) Contrary activity <small>DESCRIPTION - Content Audience</small>

Print out the framework on a large format paper and stick it on the wall. Discuss the needs of different audiences using coloured sticky notes.

Checklist for the design of tools



Think about the tools you need to design to communicate with groups a particular type of work or knowledge exchange you are going to do.

Adapt the wording of the improvement matrix to suit your practice

Figure 63. Improvement matrix suggestions for use

As a response to the suggestion of more information, such as prompts, the researcher added similar questions used during the test of the framework through workshops in order to assist practitioners to think through the design of KE as shown below.

Improvement matrix			
Dimensions Layers	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
DESIGN Improve tools by giving workshop organisers more control over the activity, and flexibility in using and understanding tools	Challenge / Briefing How can you improve the briefing that instructs practitioners on how the tool address engagement challenges?	Interaction models How can you improve the resources to enhance the job of facilitating creative engagement activities?	(Build) Resilience How can you improve the tool to encourage facilitators to deliver creative approaches to achieve the objective of engagement activities?
FACILITATION Improve tools by helping facilitators to design engagement approaches and providing indications of use and practical guidance to participants on how complete tools	Facilitator notes How can you improve the facilitation instructions of the tool?	Resources produced by facilitator How can you improve the resources to enhance the job of facilitating creative engagement activities?	(Encourage) Facilitator responses How can you improve the tool to encourage facilitators to deliver creative approaches to achieve the objective of engagement activities?
APPLICATION Improve tools by tailoring them to suit to your community needs and practice.	Example or use notes How can you improve the wording of the tool to be more appropriate for workshop participants?	Design of material How can you improve the tool visual communication to be more clear and friendly for workshop participants?	(Enable) Contrary activity How can you improve the tool to enable unexpected uses and adaptation by workshop participants?

Turn over this leaflet to see the insights into the Improvement Matrix layers, dimensions and components

Figure 64. Improvement matrix with prompts

9. Conclusion

The PhD research presented in this thesis was motivated by a personal interest in improving creative design practices in order to make better knowledge exchange processes involving more than one person. It required understanding the participatory practices and mechanisms used for enabling collaboration and the creative exchange of knowledge of those involved in an engagement activity in order to propose a change to improve current practice.

A review of the field of participatory design and co-design practices (Chapter 2) highlighted design as a set of traditions of practice, processes and working styles that are characterised by particular ways of doing design and relationships with people and tools involved in the design activity. In this sense, this thesis considered that everyone can be a designer in their own culture of practice and tools (2.1). The historical review of practices has shown how this open definition of design inspired the emergence of a landscape of traditions of practice (2.2), where people started to get involved in the design, development and decision-making processes of public and private organisations and communities, as the essence of participatory practice. The review highlighted the patterns and trends in the landscape of practice, which involve engagement roles and activities in workshop-like events and the use of tools and toolkits to support these activities. These findings provided directions for research within the field of co-design and participatory design, identifying the areas of knowledge that this thesis sought to make a contribution to. The review led to the identification of a need for tailored engagement approaches to particular situations, where a further investigation on the improvement of tools led to the research question: **How can knowledge exchange tools be improved?**

To further understand how tools are seen in co-design and participatory design practices and how they can be improved, a review of improvement and tools within the context of design was conducted (Chapter 3). The findings of the review presented the differences between improvement, innovation, and adaptation, defining improvement as a design activity that consists of a cycle of trial-and-error learning processes to improve current situations, where planning and suggesting changes in tools should lead to a better outcome and a more desired state to a group of stakeholders affected by the change (3.1). Further, the findings have also shown that tools differ from machines in terms of the degree of independence of use. Tools provide freedom to people to creatively use them in their everyday practices, whereas machines control people to perform automatic procedures.

Tools in HCD and PD have been defined as instruments that support skills and techniques for design researchers to consult experts about their needs (3.2.2) or to work together with people (3.2.3) in order to design convivial tools / objects of design that respond to a current problem or matter of concern. Similarly, tools in OD support skills of people in developing improvements to their own area of expertise, although design researchers are not in control of the process (3.2.4). Highlighting these perspectives was important to setting the scene to the main focus of current tool practice, which is limited to designing tools that envision uses to support a specific project and stakeholders affected by the project. In contemporary design practice, tools are designed to support multiple languages, enabling uses at existing projects for which they were designed, as well as future project uses (3.2.5). These tools that allow more flexibility in use are known as tools for KE design, which is composed of

overlapping practices of planning, facilitating and doing engagement activities in workshop-like events that enable a group of people to achieve a common and agreed objective.

A review of the HCD, PD, and OD theories applied in the design of tools (3.3) has presented two HCD theories from architecture and cognitive engineering, a PD pragmatic theory (e.g. Wittgenstein, Heidegger, Freire), and OD and non-hierarchical structures (e.g. von Hippel, Deleuze and Guattari). These theories have underpinned the design proposition to improve tools and oriented the methodological approach to test the proposed framework in practice. The design proposition consisted in mapping out the theories of tool design (instructions, functionality, and flexibility) and overlapping practices of designing knowledge exchange spaces and tools (Design, Facilitation, and Application) (4.1) into a matrix that shows how tools could be improved (4.2).

Building on these theories and practices, a framework for developing tools called Improvement Matrix, comprising nine components, oriented the design and analysis of three case studies as part of an action research methodology, a way to bridge design theory and practice in order to develop the framework. The investigation of the improvement matrix proposition through the action of designing and delivering workshops to engagement practitioners enabled the researcher to further develop this proposition and enhance the credibility of the theoretical framework through a descriptive analysis that pattern-matched the predicted findings and empirical outcomes of the workshop. As a response to the reframed research question of this thesis, an overall improvement matrix framework provides links to the protocol questions and the researcher line of inquiry, and summarises the case study findings.

A review of the case studies findings with experts in participatory design approaches and tools enabled the researcher to refine the framework and draw conclusions about the novelty and relevance for the KE design practices, implications, potential applications and directions for future research. The Improvement Matrix framework was found to be applicable and useful to develop tools employed in participatory design and co-design practices such as urban planning, business and management, human-computer interaction, innovation, and education. The concept of flexibility was widely accepted and new to practitioners, and the idea of thinking of a variety of applications for the same tool was highlighted as a change in one practitioner's practice of conducting workshops.

Case study reviewers have suggested the application of the Improvement Matrix beyond the original case study as a prompt to help them think about particular knowledge exchange, as a way to generate different areas of application based on multiple audiences, and as a teaching aid to support students in the creation of participation tools. However, the creative facilitation layer of practice appeared to be less important for design practitioners, as it was seen as inexistent in the role of designer in active transformation of urban spaces, as developed through experience, or as part of the design layer of practice. The use of the framework could be limited by the lack of time and resources if applied in the same way as the original case study and by the current wording used in the Improvement Matrix. Reviewers highlighted the need for describing intended uses and clearer instructions of use, such as working examples and prompts.

9.1 Limitations

There may be some possible limitations of this research that are related to the researcher's skills or methodology. These limitations are discussed in the following paragraphs.

Notetaking and lack of data management skills were two of the researcher's limitations in this study. Having more developed skills on what to look at, as well as how to capture and archive important information at the beginning could have helped in the evidence analysis, and in spotting more limitations and opportunities for further research. During the workshops, the researcher had to facilitate the activities, making sure that participants could contribute with their ideas in the workshop, while simultaneously observing and taking notes on what was happening. Therefore, the amount of self-reported evidence in this research study was too little, which required the researcher to remember events that occurred at some point in the past to analyse the evidence generated by participants. This evidence, in forms of blogs and diagrams used for demonstrating the audit trail, might limit the reader in tracing the course of the research via the decisions made and described in terms of analysis of the evidence, as it required a long iterative process that is not reported in this thesis. These limitations can be overcome through a better understanding of the theoretical and research approach undertaken in design research at the beginning of the evidence gathering and analysis.

Workshop participants completed the evaluation forms in two different ways, which made it difficult to understand if they were rating the current tool, or the improved version. Furthermore, some of the components of the matrix tested in collaboration with engagement practitioners, such as the ones in the facilitation layer, did not generate much evidence to compare with the predicted theories, which slightly differed. This could have happened due to researchers' skills, methodology, or participants' experience with tools, as highlighted in the case, which limited participants in contributing more to the research. To avoid that, a more active facilitation to make sure that participants are doing the tasks in the right way instead of relying on the workshop materials is one way to ensure a better outcome.

Although multiple triangulation strategies were employed in the research design, asking people to evaluate their own improvement suggestions, looking across others' suggestions might have generated biased evidence towards what suggestions led to improvement. Some participants might not be able to judge others' ideas (e.g. Pilot study 1) or may judge their own ideas as the best ones, as they highly rate their own suggestions. One way to see whether the new versions of tools have an impact on their practices is by tracking changes in their practice over time, as suggested in the expert review.

9.2 Future research

Considering the limitations noted in the previous section and the findings from the expert review study, there are different routes that expand and disseminate the knowledge generated in this thesis. These are summarised in the following paragraphs.

The first suggestion involves testing the refined Improvement Matrix with a different group of practitioners to develop a toolkit for a particular event. This involves testing the Improvement Matrix as a whole instead of in parts to see how they would appropriate the framework to develop their practices, tracking changes in the framework and in their practices over time. Testing the facilitation layer of the improvement matrix with a different group, who have more experience in working with tools, could also make the framework more robust by providing more ideas to develop the importance of such a layer of practice.

The second suggestion involves testing the refined framework with professional designers to create different design processes by plugging-in other design methods and tools within the

Improvement Matrix framework to redesign tools, and also track changes in the framework and in their practices over time.

The third option is a combination of experts' suggestions that involves adding new constructs, approaches, tools, and more flexibility to the Improvement Matrix, looking at the design of workshop-like events before and after they take place, such as unexpected circumstances prior to the event or evaluation approaches after events.

The fourth option involves conducting a longitudinal study in terms of impact of tools. This would involve taking multiple measures over an extended period of time to see the impact of improved tools in individuals and organisations' KE design practices, tracking the change of their practice over time.

The fifth option involves exploring further how the dimensions of tools (instruction, functionality, and flexibility) in different design research areas could work in practice. This could involve exploring the dimension of tools, for example, in practical studio activities in higher education or virtual learning environments, where learning materials or digital learning objects are considered as tools for knowledge exchange. Bringing the Improvement Matrix framework to the area of multimedia design, in which the researcher has also expertise, could lead to new ways of designing online engagement.

In conclusion, as someone with close to eight years' studying and employing design methods and who was mainly educated through traditional teacher-centred methods focused on rote learning and memorisation, I found it hard to believe that research could be done with people, and that I could rely on them to do specific tasks without controlling the whole process. However, the more I immersed my research in real life, the more my initial beliefs turned out to be unsustainable. Doing research through the practice of design and in real life has enlightened me on a more equitable approach of conducting my job as a researcher. This required me to develop an open mindset and communication and working skills to deal with external partners and explore new ways of designing and developing research that are compatible with real world concerns, challenges, activities and perspectives. In these approaches, design researchers are the catalyst and facilitator of the process, the ones who create an open space where communities of practitioners analyse their own needs and concerns and develop solutions to improve their current situations. These approaches require working in close collaboration with stakeholders to develop practices and knowledge instead of imposing them "from above and outside", as the educational progressivist John Dewey described the traditional way of transferring ready-made knowledge, which I was used to. In essence, these skills, theories and principles are part of the foundations of action research as a process whose goals are to generate knowledge and contribute to improve work and life situations.

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Appendix A - Workshop Participant Information Sheet

Leapfrog Participant Information

Improve It - Short Project



Introduction

We would like to invite you to take part in a research study, which is part of a larger research project called Leapfrog: Transforming Public Sector Engagement by Design.

Leapfrog is a three-year research project. We want to develop new ways to help people contribute to local public services and facilities. We want to test how well these new approaches work, in a series of research projects.

This sheet provides information on what research we are conducting and how you would be involved. We invite you to read this carefully before deciding if you would like to participate. We will also go through the information with you verbally. If you have any questions, please let us know.

What is Improve it?

In this short project, we are working with engagement practitioners, and academics to explore the challenges experienced when improving tools through collaborative design workshops.

We will be collaboratively re-designing and testing tools and methods to improve engagement tools, in order to offer a better use of leapfrog tools.

The new version of tools will be made widely transferable and freely available.

What does the project involve?

- We would like to invite you to take part in an interactive co-design workshop with other engagement practitioners where together we will test a framework for improving creative engagement tools.
- The improved tools will be made freely available on our website to try them out for yourself.

What are the Benefits of Taking Part?

- You will be able to become part of a network of people interested in collaboration and creative engagement.
- You will receive the tools and resources that come out of the process.

Thank you for reading this information sheet, please sign the consent sheet to take part.

More info at www.leapfrog.tools

If you have any concerns or complaints about this project you can contact **Judith Mottram**, Director of the Lancaster Institute for the Contemporary Arts, LICA Building, Lancaster University, Bailrigg, Lancaster, LA1 4YW
E Mail: judith.mottram@lancaster.ac.uk • Telephone: 01524 594395

This study has been reviewed and approved by the Faculty of Arts and Social Sciences and Lancaster Management School's Research Ethics Committee.

What do we collect and share?

This workshop forms part of the research for the Leapfrog project. While you participate in this research, we will write field notes and capture photographs, video, audio (via dictaphone) and written responses. Given the data capture methods of this study, efforts to anonymise your contribution will be made at the point of recording as we will be recording group discussions and feedback, but non-identifiability is not a guarantee.

Videos and photographs may be taken of you taking part and presenting in workshops and you may be identifiable, unless you ask us not to before the workshop.

The information/audio/video/images we collect may be used in documentation published for academic, educational or promotional purposes. This will include future reports, articles, and presentations relating to the Leapfrog project, and web-based publishing, which can be viewed by the general public. We will only publish your name or quotes (e.g. on our website or in our academic articles) with your permission.

Information about you will be stored securely for at least 10 years and only project researchers will have access to it. We will only publish photos that reveal your identity with your agreement. We will only use your contact details to get in touch with you for project purposes and you can be asked to be removed from our mailing lists at any time. We will not share your information without your consent.

Do I have to take part?

No, your participation is entirely voluntary.

You may limit your participation, withdraw at any time for any reason, or ensure we do not use any photos, film or audio, which identifies you. To withdraw, please contact us up to two weeks after your participation and we will do our best to remove any information (whenever possible) that identifies you from our records; but after this point the data, which identifies you, will remain in the project.

To limit your participation or withdraw, contact the PhD Researcher **Rosendy Fernandez Galabo** either by phone 07961 033464 or by email r.j.galabo@lancaster.ac.uk or the Leapfrog Principle Investigator, **Leon Cruickshank** by email, telephone or post. Email: l.cruickshank@lancaster.ac.uk. Address: LICA Building, Lancaster



Appendix B - Workshop consent Form

Leapfrog Consent Form
Improve It - Short Project



Please tick as appropriate

I confirm that I understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	<input type="checkbox"/>
I understand that my participation is voluntary and that I am free to withdraw up to two weeks after I have participated in the study without giving any reason.	<input type="checkbox"/>
I give my permission for the Leapfrog team to photograph/video and audio record me, while participating in this research for the Leapfrog project.	<input type="checkbox"/>
I understand that any such photos/videotape/audio or other digital recording will be the property of the Leapfrog research group, which is a pan-university project funded by the AHRC Connected Communities project.	<input type="checkbox"/>
I understand that any information given by me may be used in future reports, articles or presentations by the researchers for academic, educational or promotional purposes, including publication to the Leapfrog website, and my personal information will not be included. Efforts to anonymize my contributions will be made throughout field work, but non-identifiability is not a guarantee.	<input type="checkbox"/>
I understand that my name will not appear in any reports, articles or presentations without additional consent being sought.	<input type="checkbox"/>
I understand that data will be kept according to University guidelines for a minimum of 10 years after the end of the study.	<input type="checkbox"/>
I agree to take part in the Improve It project.	<input type="checkbox"/>

Participant Name: Signature:

Date:

Name of researcher: Rosendy Fernandez Galabo Signature:

Date:

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

One copy of this form will be given to the participant and the original kept in the files of the researcher at Lancaster University



Appendix C – Leapfrog tools and instructions (Most voted or used in the workshops only)

Plan B

PLAN B Make sure jobs get done even when things go wrong.

What if...

1 _____
2 _____
3 _____
4 _____
5 _____

Write unexpected things that might happen here

Write your original plan here

1 _____
2 _____
3 _____
4 _____
5 _____

Write how you would adapt here



For more information, visit:
<http://leapfrog.tools>





PLAN B

Make sure jobs get done even when things change

Important tasks can easily get delayed or halted if things don't go as expected. This tool helps people think through what might go wrong, and agree some alternative ways of getting things done.

TIP:
A great follow-up to Role Bingo!

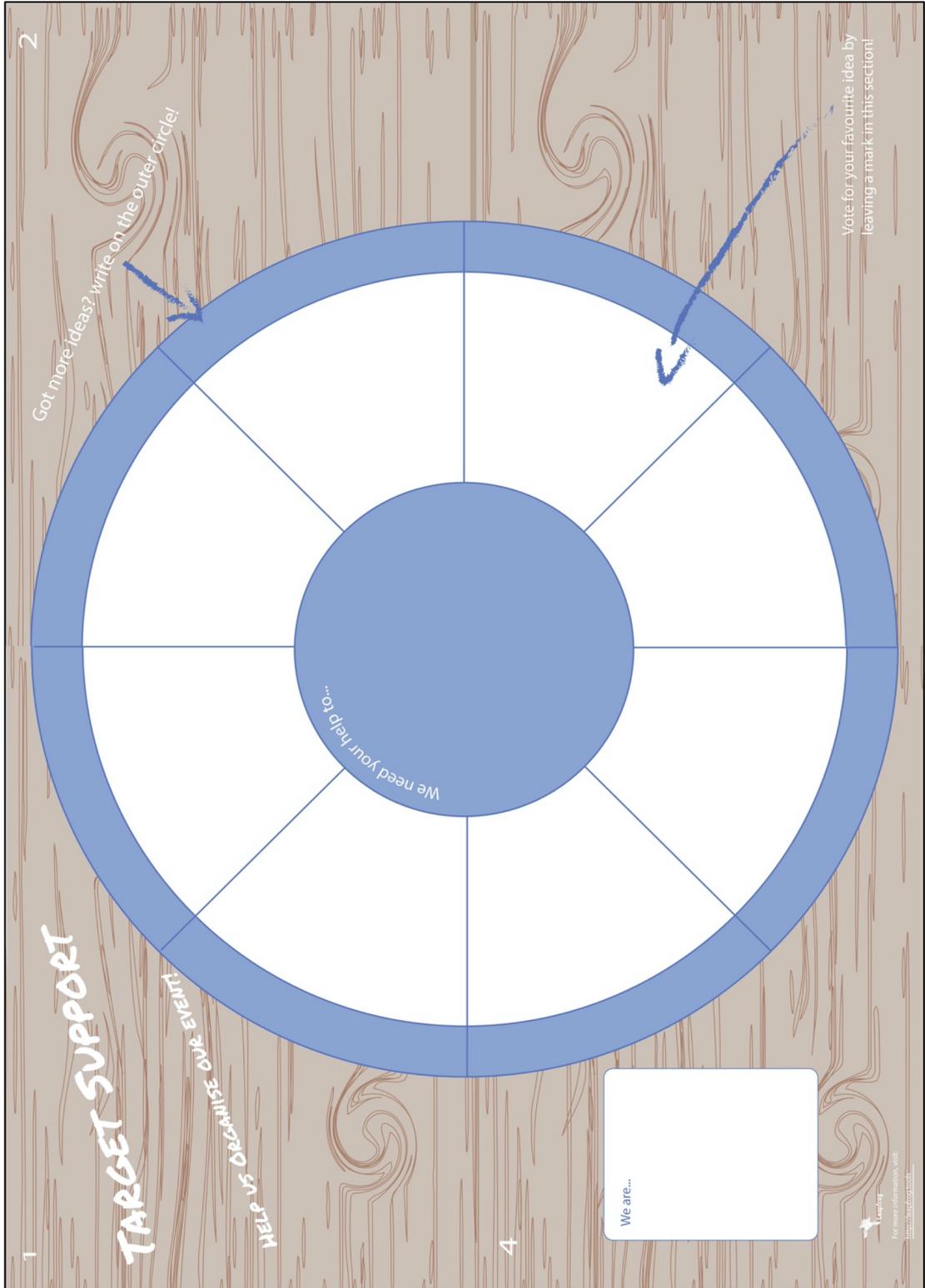


Please let us know if Plan B worked!
Once you've given this tool a try, text **Leapfrog** to **07537 414393** to answer 5 simple questions.



Co-designed in Scotland
This tool is co-designed with members of community organisations on the Isles of Mull and Iona, and the Kyles of Bute.

Target Support (A2 size)



PLAN B

Make sure jobs get done even when things change

Important tasks can easily get delayed or halted if things don't go as expected. This tool helps people think through what might go wrong, and agree some alternative ways of getting things done.

TIP:
A great follow-up to Role Bingo!

Co-designed in Scotland
This tool is co-designed with members of community organisations on the Isles of Mull and Iona, and the Kyles of Bute.

Please let us know if Plan B worked!
Once you've given this tool a try, text **Leapfrog** to **07537 414393** to answer 5 simple questions.



Target support

1

2

4

TARGET SUPPORT

HELP US ORGANISE OUR EVENT!

We need your help to...

Got more ideas? write on the outer circle!

We are...

For more information visit <http://targetprooft.com>



Leapfrog

TARGET SUPPORT

Try out your ideas and see which stick

A little bit of feedback can go a long way, and trying out ideas on paper is often far better than trying them out for real. Target support lets you share ideas publically, generating interest and gathering feedback.

Co-designed in Scotland
This tool is co-designed with members of community organisations on the Isles of Mull and Iona, and the Kyles of Bute.

On or off target?
Once you've given this tool a try, text **Leapfrog** to **07537 414393** to answer 5 simple questions.

Storyboard

The storyboard template features a decorative border with a repeating geometric pattern of overlapping triangles in shades of green and yellow. The main content area is a grid of 12 rectangular panels, arranged in 3 rows and 4 columns. Each panel is divided into two vertical sections by a thin line. The top-left corner contains a circular icon with the text "Try Me". The top-right corner contains the text "Print more at www.leapfrog.com". The bottom-right corner features the Leapfrog logo, which includes a stylized frog icon and the word "Leapfrog".

Everybody

What you write and draw on here is secret and will go into an envelope! Email: (Optional)

Think about
the layout of a new youth centre

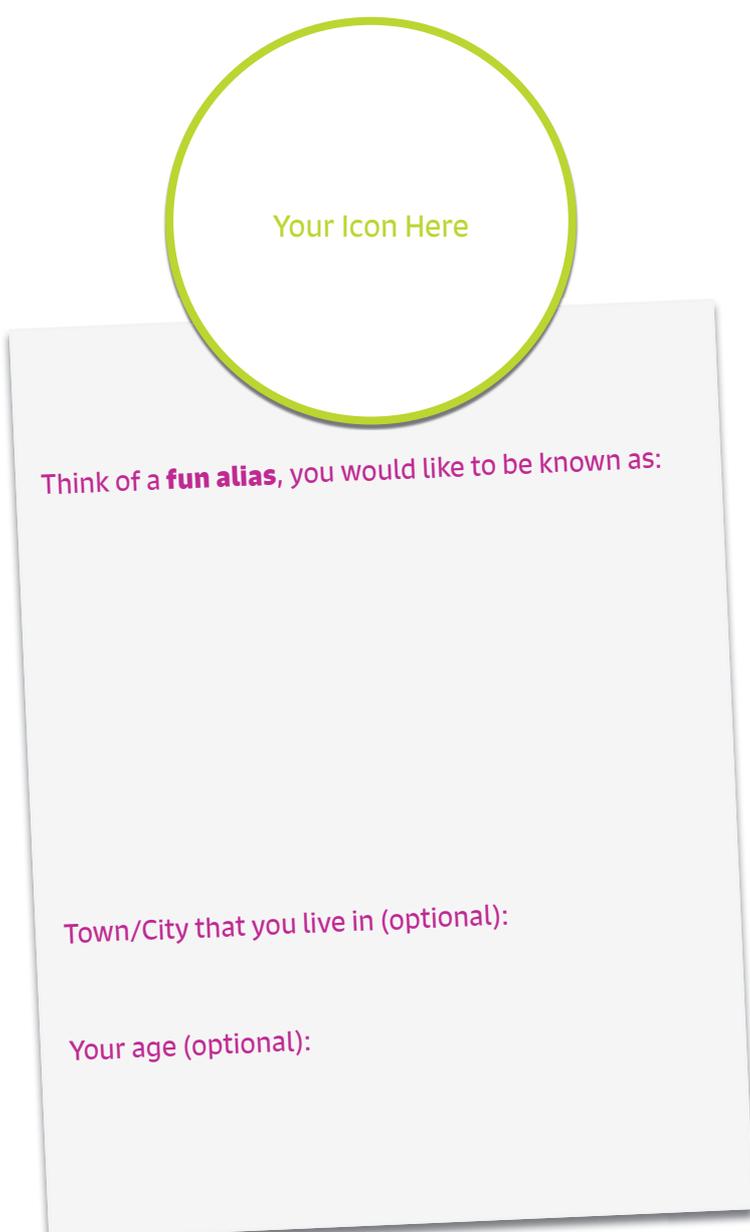
Follow steps 1 to 4 whilst thinking about the above statement.

- 1**
Find the character above that represents the real you and personalise them.
- 2**
Write or draw your ideas or questions about the above subject in the cloud shape.
- 3**
Write or draw your emotions, needs or what you would like in the heart shape.
- 4**
Write or draw what you think needs to be done or what should happen in the arrow shape.

Leapfrog

www.leapfrog.tools

Everybody (Envelope)



Your Icon Here

Think of a **fun alias**, you would like to be known as:

Town/City that you live in (optional):

Your age (optional):



www.leapfrog.tools



Topic tally

Our Meeting: Topic Tally

Date _____

Things we have decided together 

Me

Things I would definitely like to talk about

1 

2 

3 

Things it would be good to talk about

1 

2 

3 

You

Things I would definitely like to talk about

1 

2 

3 

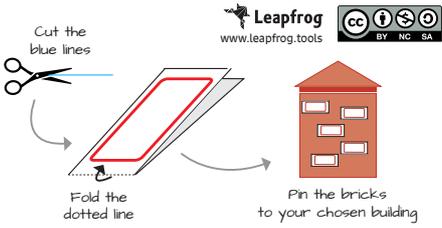
Things it would be good to talk about

1 

2 

3 

Building success

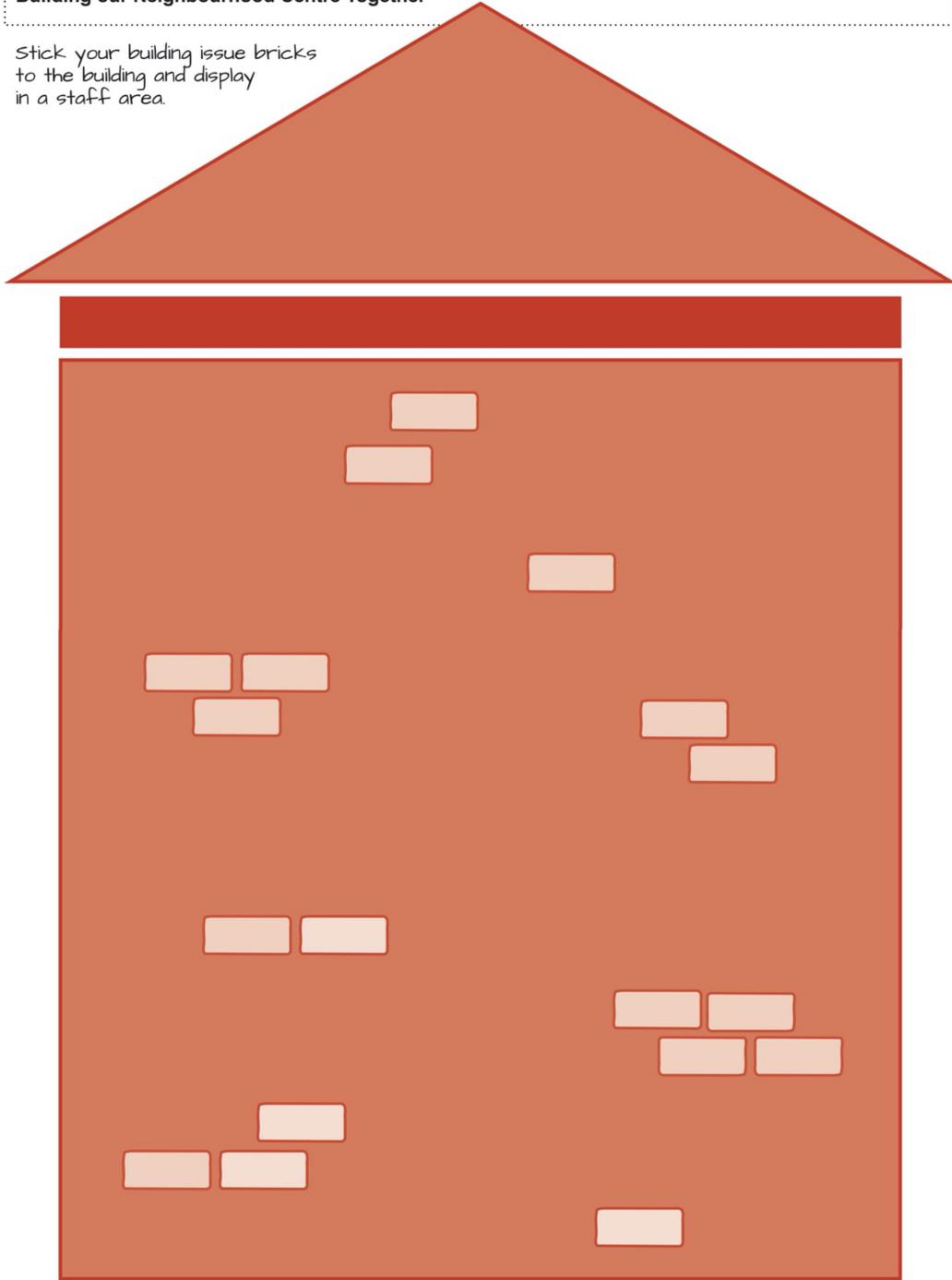
<p>Building Bricks Guidelines</p> <p>The bricks are a metaphor for the things a new team need to consider for working together effectively in a building.</p> <p>The team should come up with fun/interesting headings and subtitles for the categories and an activity to help them work together.</p> <p>This sheet contains examples you can use but we challenge you to think of your own</p>	
<p>Team Activity example: Using the floorplan to identify things such as emergency exits/fire extinguishers.</p>	<p>Keeping Safe Health & Safety</p>
<p>Team Activity Example: A Google Doc type document which lists all equipment in the building. Any new equipment which is needed. Create outlook calendar to make a booking diary for equipment.</p>	<p>Bits & Bobs Resources & Equipment</p>
<p>Team Activity Example: List of where to find premise management documents. If digital this would include hyperlinks.</p>	<p>Keeping Legal Premise Management</p>
<p>Activity Example: Establishing ground rules/social contract around the building.</p>	<p>Brews & Brooms House Keeping</p>
<p>Activity Example: Discuss how to layout space. What rooms, what are they fit for, who's using and who's booking.</p>	<p>Space Shared or Booked</p>

Building Success

Building our Neighbourhood Centre Together

Name of Building:

Stick your building issue bricks to the building and display in a staff area.

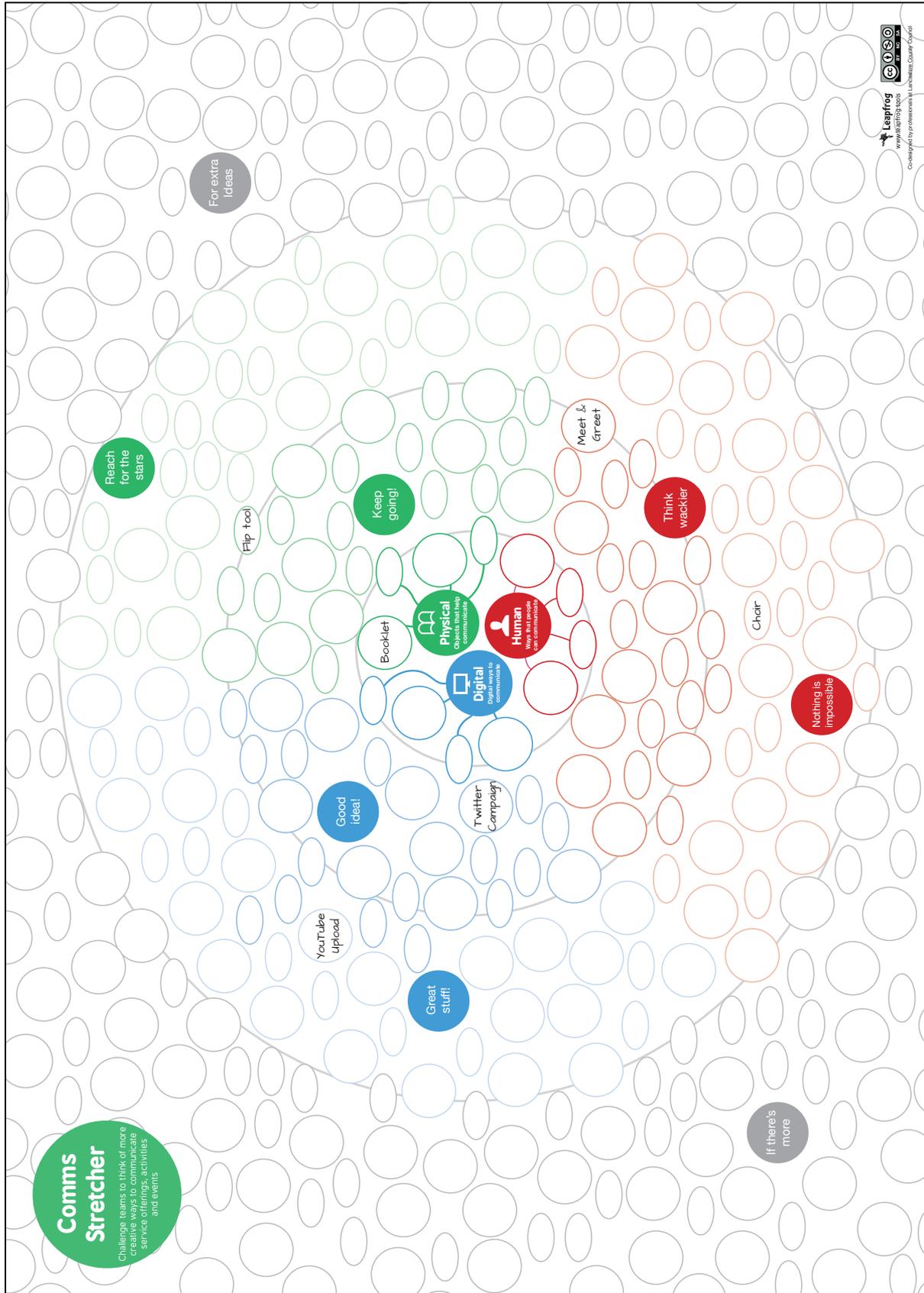


Co-designed by professionals at Lancashire County Council

Leapfrog
www.leapfrog.tools



Comms Stretcher (A1 size)



Comms focus

Comms Focus

Who are you going to engage with? What would you do normally?

This would be perfect because: **Human** Possible hiccups:

Tick the idea if you choose it

This would be perfect because: **Physical** Possible hiccups:

This would be perfect because: **Digital** Possible hiccups:

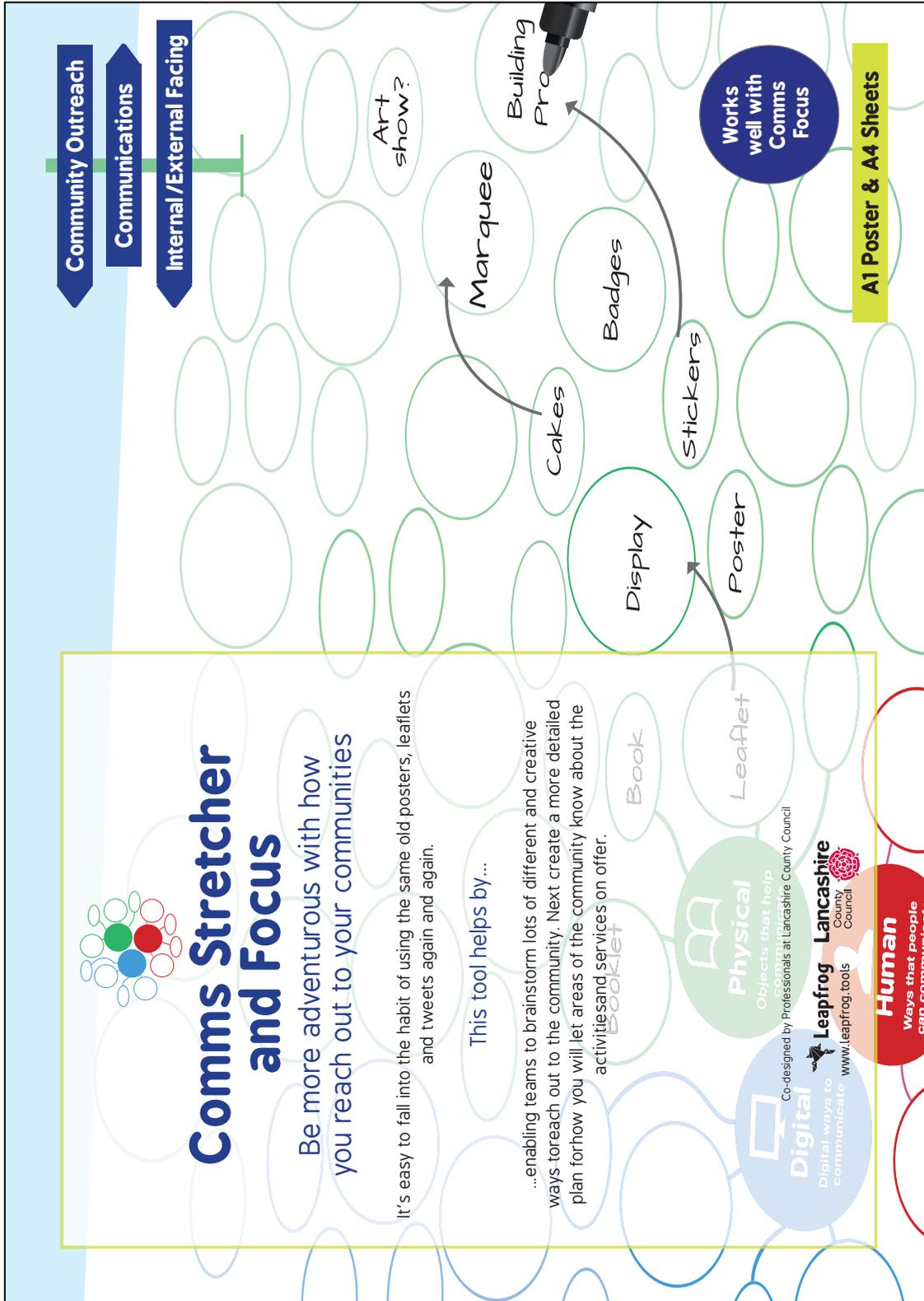
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How did it go?

This bit will come in handy in the future!

Co-designed by professionals at Lancashire County Council





Flow cards

<p>Flow <i>what do customers want & need?</i></p>	<p>Centre Your Centre's Name</p>
<p>Name Person's Name</p>  <p>Description Short Description of user. For example, how old are they, what do they do for a living, what do they like to do?</p>	<p>In the Space</p> <p>Visiting Times</p> <ul style="list-style-type: none">  AM /PM /Evening  Weekdays /Weekend  Often /Occasionally /Rarely <hr/> <p>Questions they Frequently Ask</p> <p>"Where is this?"</p> <p>"Who should I speak to for this?"</p> <p>"Do you have this?" </p>
<p>Common Needs</p> <p>Homework support</p> <p>Place to meet friends</p> <p>Study space</p> 	<p>Services Used the Most</p> <p>Homework club</p> 
<p> Leapfrog </p>	<p>Co-designed by professionals at Lancashire County Council www.leapfrog.tools</p>

Flow: Customer Cards

Focus on your customer's needs

Multi-service centres usually offer lots of different services and activities for different groups of people in the community. It can be difficult to really understand and remember what the services offer and most importantly, who is using them and why.

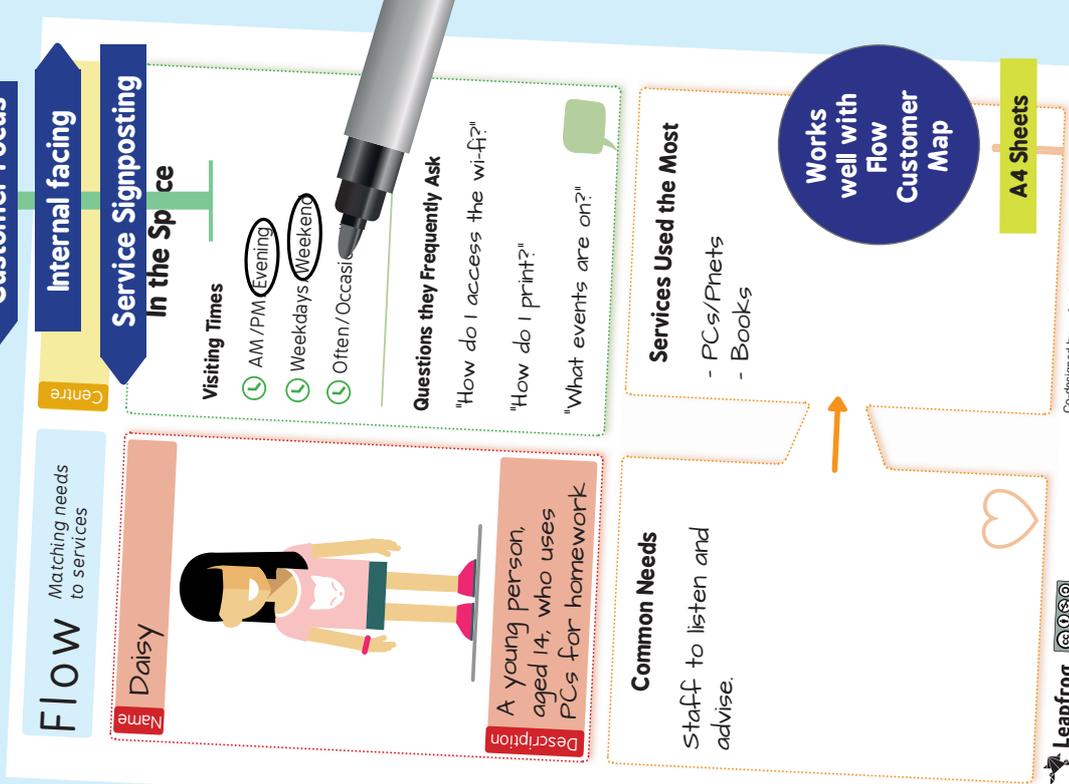
This tool helps by...

- ...creating an opportunity for teams who perhaps work for different services to meet together and map out an understanding of who the different types of users are, what their needs are the how they match up to services and activities.

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www.leapfrog.tools





Snapchat & Story

DATE 05/12/2017

SNAPSHOT

PLACEHOLDER - WRITE IN A SENTENCE A CATCHY SNAPSHOT OF YOUR STORY

PLACEHOLDER - Write where and when it happened

STORY

PLACEHOLDER - Write a title for the story in here

PLACEHOLDER - Write down the story.
Some tips:
- Provide a context - The issue that you want to tell - Explain why that issue is important - Provide some details to make it look real - Give some conclusions to show the importance of this story

PLACEHOLDER – Keep writing here if you need more space

MEASUREMENT

Which measure indicators could this support?

PLACEHOLDER - Write down a list of outcome measures (for example from the CQC Framework)



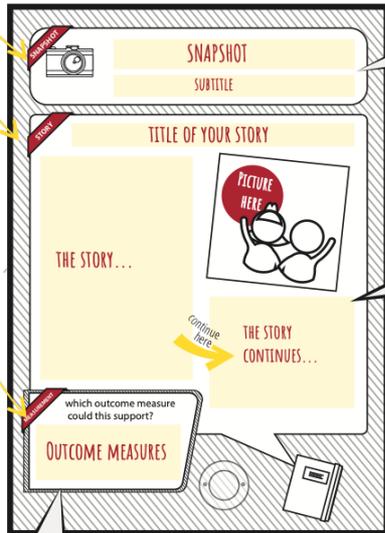


This tool was co-designed with young patients and staff from the Blackpool Teaching Hospitals NHS Foundation Trust ©

SNAPSHOT + STORY

Create a quick overview of engagement work to share with others in your organisation

3 PARTS This tool has three sections for a clearer understanding of the story that you want to tell



SNAPSHOT

Use just a few words to give a catchy headline and invite people to read the full story. Add a subtitle with a few more key details, for example, where the story happened, who was involved, etc...

STORY

Here you can provide further detail and include a photograph or image. You might also describe engagement work you have planned/completed that can support improvement to your service.

Some tips:
 - Provide a context
 - Offer some conclusions or recommendations to draw out the meaning of this story

Use a picture that illustrates the story. This will help people see the reality of your story.

OUTCOME MEASURES

For some people, such as managers, outcome measures are important. Use this section to point to the strategic outcomes or contractual measures relevant to this work. Use for example, the CQC Framework, Key Performance Indicators (KPIs) or any other type of measurement.

SHARE IT!

Promote the completed tool to service users and managers, or include in reporting to provide a quick overview.

TIP

Would you like to share and get feedback from your story? Why not to try the Feedback Cycle Request tool at www.leapfrog.tools



This tool was co-designed with young patients and staff from the Blackpool Teaching Hospitals NHS Foundation Trust

The Small Things
 Don't let the little issues get in the way of the big picture

Sometimes the small things such as who buys the milk and who puts the furniture back after an event can become big issues for teams. This is particularly the case for teams who work for different services and use the same building at different times of the day.

This tool helps by...

- ...offering a fun and friendly way for staff team members to prompt, provoke, ask questions and obtain feedback from each other.

Team communication
Internal facing
Planning resources

Help
 Can't find the back door keys
 Name: CR... Urgency: NNNNNY Date: 10/02

Response
 Put them on your desk

An Idea
 Children & Elderly Craft
 Co-designed by Professionals at Lancashire County Council
 Leapfrog Lancashire County Council
 www.leapfrog.tools
 Name: _____ Urgency: _____ Date: _____

An Idea
 Share the

A4 sheets or Stickers

Feedback Cycle Request



FEEDBACK CYCLE REQUEST

Write the title of the story in here



What is the story?
PLACEHOLDER
This light blue section is for the person who wants to request feedback.

Write down a short version of the story.
Some tips:

- Provide a context
- Identify key feedback
- Explain why the feedback is important
- Offer some conclusions or recommendations to draw out the meaning of this story

What does this story mean for you?

Insert a picture here

What have you / will you do with this story?

We think it is important because...
PLACEHOLDER
Explain with your own words why this story should matter to the organisation

Completed by

Date





Draw or drag circles over the emojis that match your thoughts

Draw or drag circles over the emojis that match your thoughts

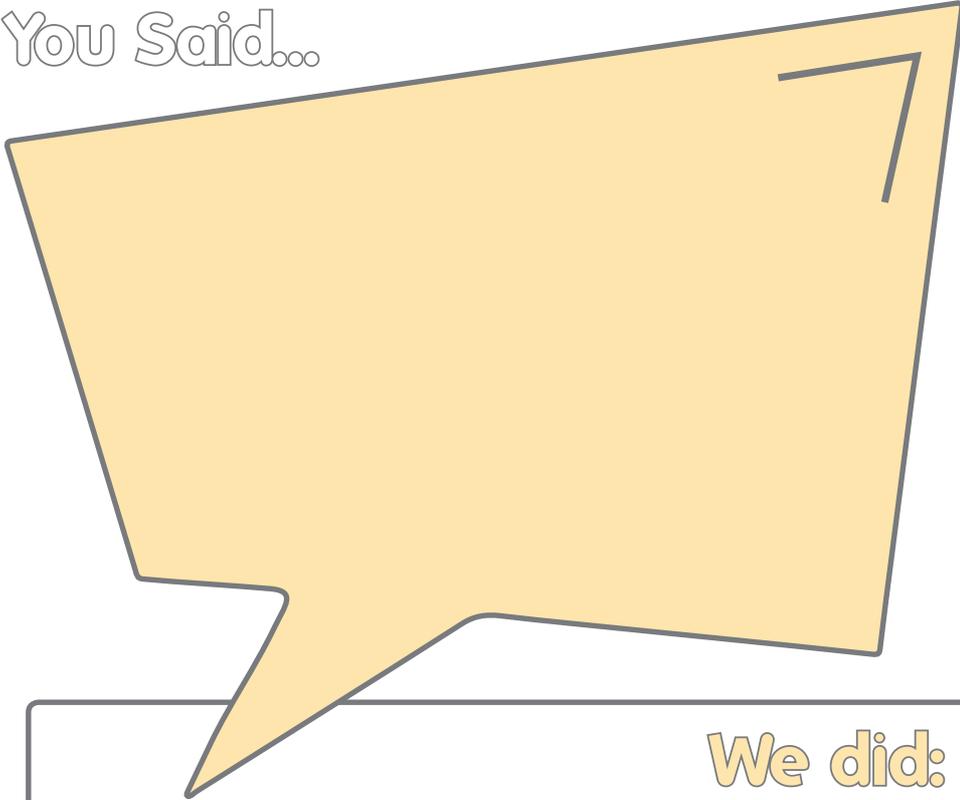
This tool was co-designed with young patients and staff from the Blackpool Teaching Hospitals NHS Foundation Trust



You Say We Did

 Set out your goals and keep track of your progress

You Said...



We did:



leapfrog.tools



You Said, We Did



Set out your goals and keep track of your progress

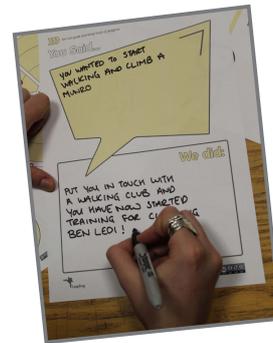
Tool Guide:

The You Said, We Did tool is a simple way for a service provider to make visible what users have asked for from their service and what the provider has done in response. This tool could be given to an individual service user to show how things have changed in response to their own needs, or put up on display at particular public locations, such a notice board, to show to a whole group how a service is responding to their feedback and input.

Once downloaded the tool can be printed out in A4 or A3 (or bigger if possible). Write in the 'you said' section any feedback, requests or ideas users have had about a service or activity. Then store the sheet ready to use again some time later (exactly how much time will be up to the provider). After a set period of time, complete the 'we did' section with any actions taken in response to what people have said. The tool can then be used to show progress with an individual or put up on display again to show an entire group.

We think the tool is an easy and effective way to engage with people about their feelings about a service and then transparently show what has been done.

You Said, We Did is an interactive evaluation tool co-designed by the Glasgow School of Art and health care professionals who work with adults with learning difficulties across the Highlands of Scotland.



leapfrog.tools



Role Bingo

★ Role Bingo ★

Team sheet

Deadline:	Deadline:	Deadline:	Deadline:
1	2	3	4
Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>
Deadline:	Deadline:	Deadline:	Deadline:
5	6	7	8
Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>
Deadline:	Deadline:	Deadline:	Deadline:
9	10	11	12
Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>
Deadline:	Deadline:	Deadline:	Deadline:
13	14	15	16
Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>	Who: <input type="checkbox"/>

List, allocate and monitor tasks for an activity.

Write down the tasks needed to complete for your event. Assign a deadline and a person to any task. Keep track of completed tasks by crossing them out as you go.

Event:

For more information, visit:
<http://leapfrog.tools>

★ Role Bingo ★

Individual sheet

Notes:

Notes:

1	2
Deadline:	Deadline:
3	4
Deadline:	Deadline:



Pick your tasks and cross them off as you complete them!

Pick and write down the tasks that have been assigned to you. Cross them off as you complete them. Remember to update your team in the meeting about their completion status.



For more information, visit: <http://leapfrog.tools>





ROLE BINGO

Decide what needs doing, and who will do what



One of the key parts of organising an event is dividing up work and who does what. Role Bingo helps a group agree what needs to be done, and makes allocating tasks less formal, and more fun.



Co-designed in Scotland
This tool is co-designed with members of community organisations on the Isles of Mull and Iona, and the Kyles of Bute.



Deadline:		Deadline:		Deadline:		Deadline:	
12/05	FIND A VENUE	12/05	CATERING	13/05	BAND	14/05	PETTING ZOO
Who: SUE	Who: ED	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE
Deadline: 15/05	EGG HUNT	Deadline: 12/05	EVENT PROMO	Deadline: 11/05	POSTER DESIGN	Deadline: 10/05	RENT TENT
Who: SUE	Who: FIONA	Who: FIONA	Who: FIONA	Who: FIONA	Who: FIONA	Who: MATT	Who: MATT
Deadline: 15/05	RAFFLE	Deadline: 14/05	EGG PAINTING	Deadline: 12/05	KITE MATERIALS	Deadline: 11/05	PLAY GROUND FUNRAISER
Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE
Deadline: 10/05	GUIDE DESIGN	Deadline: 11/05	EASTER BINGO	Deadline: 11/05		Deadline: 11/05	
Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE	Who: SUE

A full house?
Once you've given this tool a try, text **Leapfrog** to **07537 414393** to answer 5 simple questions.

Appendix D - Pilot Study 1: Transcriptions of proformas and evaluations

Model of interaction Sheet

Target support	Plan B
<p>Rephrasing the question: What would it take to start using this tool?</p> <p>Use/function of tool not clear</p> <p>Layer (ontology) Require of whom?</p> <p>Plus example phrases a tool to customise + change</p> <p>Example?</p> <p>Printing</p> <ul style="list-style-type: none"> - How big? - How many people? - Where will it go? - What will you do with the info? <p>Can text be removed?</p> <p>Materials</p> <ul style="list-style-type: none"> - Pen - Post-its - Sticky dots <p>Instructions not clear</p>	<p>Interactions:</p> <ul style="list-style-type: none"> - Get plan A in order - Ask for single sentence describing plan A from all. - And recall to together
<p>Improvement</p> <ul style="list-style-type: none"> - More ideas space - Counting dots space - Additional support circle (Action) 	<p>Improvement</p> <ul style="list-style-type: none"> • Mechanisms of tool materials (We focus on mechanisms on this) <p>A. Articulation</p> <ul style="list-style-type: none"> - Space - Level of detail - Scope + scale of plan <p>Building resilience. Personal resilience Parent/Child tool</p> <p>B. Instruct to use single words/short phrases (It's a feature)</p> <ul style="list-style-type: none"> - Drop the circles <p>C. New coin per risk / Mitigation pair</p>

	<ul style="list-style-type: none"> • (Propagating > Rate risks by likelihood) • Divide the coins between what's in and Scope for mitigation
--	--

Challenge / Briefing sheet

Target support	Plan B
Visualising + dqp People's support and particular ideas Draw attention to itself Solves problem of <ul style="list-style-type: none"> - Idea generation - Support/Capturing - Support for ideas <ul style="list-style-type: none"> • Fixed ideas • Finite shape But if you need the ideas to be bounded – because there is only one chance to engage. Anonumous voting – same democracy	Step 1 - Clarify and articulate Plan A – Shared vision or mission / a shared language - Consensus 2 – Catch negatives for problem resolution Rank most problematic and address 3 – Mitigation strategies
Improvement <ul style="list-style-type: none"> - More ideas space - Counting dots space - Additional support circle (Action) 	Improvement <ul style="list-style-type: none"> • Mechanisms of tool materials (We focus on mechanisms on this) D. Articulation <ul style="list-style-type: none"> - Space - Level of detail - Scope + scale of plan Building resilience. Personal resilience Parent/Child tool E. Instruct to use single words/short phrases (It's a feature) <ul style="list-style-type: none"> - Drop the circles F. New coin per risk / Mitigation pair <ul style="list-style-type: none"> • (Propagating > Rate risks by likelihood) • Divide the coins between what's in and Scope for mitigation

(Build) Resilience

Target support	Plan B
Improvement <ul style="list-style-type: none"> - Sticky dots not markers - Make it open to electoral abuse 	Improvement <ul style="list-style-type: none"> • Not Plan I • • POSSible

Evaluation sheets (Group 1)

- Model of interaction 5.5

Appendices

- How appropriate is this category? (To tasks we dip?)
 - o Categories very hard to understand + differentiate
- How effective was improving the tool using this category?
 - o Hard to differentiate categories
 - o Team lifting required at the end of workshop

Evaluation sheets (Group 2)

- Model of interaction 5.5
 - o How easy was it to understand the task? Yes for us, but not necessarily for others
 - How appropriate is this category?
 - o All the categories are appropriate
 - All effective but not individually. **Need to be grouped together**
-
- G1 (C): Difficult to fill out the evaluation form, because I lost her. I don't know what you want me to write on this.
 - G2 (N): If you put these three categories together, it could be one. It doesn't need to be three different scales.
 - G1 (H): It's model by itself doesn't quite fit with the experience so far.
 - G1 (C): When you begin the workshop, you need to be much clearer to explaining things to people. **What are you doing, and why are you doing it.**
 - o I write people's research into documents that general public can understand. You will be surprised, how is really simple you have to go to people to grasp things that you think is relatively simple. Because I have no idea of any of this, all these tools. I don't know what you want. What you really are talking about. I can understand tools, but I couldn't quite grasp the language of the first one, I couldn't understand what "this element describes which interactions... (definition)". That makes no sense to me, I find actually really difficult to understand what you...
 - G2 (A) What constitutes interaction in that? It's an odd concept. We know and use it, but how easy is used in this workshop? In what point?
 - G1 (C) It is completely unclear, what you mean, what you wanted. I just followed you and was enjoying the conversation, and started to make sense to me. But, you've got say three or four people sat here, who have never seen this before, don't know what tools are. They will just be like "What?" So, you really think about your audience, you are going to this, what level of expertise and understanding they can have.
 - G1 (H) – Even the word element, what element? The design of the tool? The tool of itself. I know your module in my head, so I have a got rough idea of that. I think I mean by these three, it is like a venn diagram of interaction, brief and resilience, that build up what tool is. But, for some reason, it doesn't quite land
 - G2 (A) – I think there are a couple of more issues, all the language in that, is too hard for general group, and you got think about the average language skills in this country is the readership of the sun. If you are gonna target your language, you need to make it communicate clearly than the sun does. That's mean a lot of simplification

- G1 (C) – That’s really hard to do that, because those are very subtle. You are using a huge mallet to hit a small nail.
- G2 (A) – I would say **that challenge and brief are resolving those issues** help to understand what **interaction** is for. So, they need to come first and try to solve that before start to solve resilience.
- G1 (H) – For me, it’s kind of creating a self-fulfilling prophecy, because you are asking people to think of what kind of Brief this is gonna be? What engagement problem could this solve? And therefore, the interaction come up to solve that problem. But, it doesn’t necessarily improve things through that, I wonder. I wonder if by asking people what is the challenge that they don’t necessarily need to grab all so easily in ways in which tools work, what if they are challenges that are presented doesn’t work for that. But, then is what about what you are researching, whether is about people thinking in generic ways about: it could solve this, or that, or doing like this, or I can change it there. By thinking like that, or just thinking flexibly at anyway. So, what’s happen with that deadline. I can see these three things are in relationship, but thinking generically about them, at least one of them ends up being a bit last requirement.
- G2 (A) – I feel like you need to use the tools in order to offer resilience more effectively. That’s what is kind of concern at the minute, I’m imagining myself through the use of the tool, in order to resolve it, but I did it in an abstract level, because we didn’t have time to apply, or have a need for a specific context of use. If I already use the tool, I much better position to critique its effectiveness in terms of did I understand any particular point, and is breaking down to these simple levels. Did I understand what is being asked of me in each section of this development. I need to answer those questions, to effectively answer that interaction section, and effectively grapple the notion of what is asking of me.
- G1 (H) - Tool use is a way to work with that. Start people off with an example, so this group, you are gonna imagine completing this tool with an example of a problem
- G2 (N) – You can have an activity where is a simulation where you set them in the problem, and you give them a tool, you need to solve this problem with this tool, so they know the problem, and they come up with a solution with the tool, and in that way, you can resolve the issue he said, around not being in an abstract kind of thing.
- G1 (C) – But you should be able to grasp it, that’s the thing. I think the problem of this workshop is that there were two levels: (A) the theory that you presented with, you got questions and misunderstands, that I’m not grasping the subtilty in your theory, but also it’s more confusing, because I always not understood exactly what you want us to do, in each exercise.
- G2 (A) – Which is also build on that theory
- G1 (C) – Which cause me, I feel really stupid now. I genuinely feel like I’m stupid now, because I haven’t understood, I haven’t grasped it. Actually, as a someone who is trying to be a teacher, if that was my student, I just don’t get this, I just feel stupid now, that’s my fault, that would be my fault. You really need to, clearly, set out what your theory is, so people can understand that, and that’s what we want to do. Or you just get them to do the tools first, and then you go through this theory, and then you go through this theory and improvement stage, and how you might improve. Because then you can use examples of what

the interaction was, when they are filling up the tool, or how you might use it on the flexibility section, and briefing section is the instructions.

- G1 (H) – I think you are absolutely right. It might be that you don't need us as workshop participants to engage with your theoretical module, so if this is the model you are building, and now you wanted to test through the workshops, that we don't necessarily engage **with this**, head on, maybe there is a way a part where you can cut through it for us, that we still doing the things you wanted us to do, but we are not literally looking at your model.
- G1 (C) – You are right, you said is a self-fulfilling prophecy. What we then want us to get through how improve this aspect, you are actually recording our conversation, then when you describe it, and go back to it, and analyse it. Then it should be clear, which elements we are talking about, because you subtly, perhaps directed us toward something or that's what you get us to improve your tools is asking us to do, but we don't have to engage with your theoretical framework.
- G2 (A) – My take is this: I don't want to see, this level in a workshop at all. My concern will be how can my basic responses to this, oh I don't understand that, be translated to information for you, which is valuable. That's where we should be gathering, because as we going through this, I couldn't work the logic out across it, that's the kind of discovery to me that says there is out of play here.
- G2 (A) - I had absolutely no need to know your theoretical framework, my concern should be: **It's this thing gonna be an use to me? Did it perform well for me in my use? Can I offer a critique based on that? So no one will suffer the indignity?** If I am in the real world, and I've being offered this? And I've been in the real world and being offered this kind of thing. I'm concern that it's clear needed to use, where is not, I'm little bit outraged that is not better, what I should be doing is offer, these specific points of critique where is fails to communicate its intent. Now it what is missing from this (EVALUATION). What is the stated intent of this, how much did it meet it?
- G1 (H) – Looking at this tool, if started off like: here is some leapfrog tools and I want you based on what you are seen in front of you, I want you to guess, from these choices, which of these lit bits are what the tool is intended for. Is it (A) intended to catch mice in the field. **Maybe if for testing intent to start with, and improving on that intend, maybe get people into that. Maybe that could be a way of starting that.**
- G2 (A) – You can't do that jump "challenge/brief" bit, without an understanding of intent. **You either present the intent beforehand or a critique after use.**
- G1 (H) – or maybe there is no right and wrong answer, and actually is about.
- G2 (A) – Tool are inherently messy, that's fine. It's okay to be messy, but within all that mess, there is an intent, and that's you are trying to clarify and where the useful bits are, you might have outlined information where people misunderstood the tool, but you actually are looking at the bit in the middle where people have got it, and use it usefully.
- G1 (H) – But it also capitalising on this misunderstanding, and seen them as useful things, and generative by themselves.
- G2 (N) – You didn't give us a lot of input in between the kind of structure, workshop have. You basically talk about teaching and learning in the workshop, and how you deliver it, you need to have a concrete structure of you are giving input, so we understand before this module is handed over to use. What are you

going to talk about. And even in the start of the workshop, for people to understand what level you are coming from, so you have this objectives set, today we didn't know we are gonna do, all the way through. You said we were going to look at tools, but which sort of tool are they. Giving an example of one of the workshops, I was working with a bank Pakistan, I did a workshop for them, I put them in a problem, and that was a simulated problem. So they came out stressed with the problem, and they need a solution right? At that point in time, you ask them what problem they face. So you tell them: time management, problems at people listening to us, communication, this and that, and then you set them up for this tool. Then you give them a brief of what you think an element is or what kind a tool could be, then you set up: this is what tools are, you introduce to this tools. **You need to introduce to tools, then you divide us into groups.** Then you further look into this tools, and how this could be used. That input must be there, if that input isn't there, [G2(A): Unless we've used it]. She has problems, I had problems too.

- G1 (H) – Me and R had problems too. G1 (C) – That's why we are in different group.
- G2 (N) - That's what I'm saying. I'm not understanding what this tool for. That's the questions, we started to critique the tool, instead of understanding the tool. Andy was going to a different angle, he was trying to critique, and I was trying to understand the module. Everyone came with a different mode. If you haven't got a prologue, and why we are in the workshop. Everyone is gonna be confused. Because it is a honest feedback, it's basically constructive feedback for you. I've always got this when I started to do workshops, you know you have this focus groups, and you invite people, and you give your constructive feedback. By the end of it, you've got the input and output, in the end you have this closing. The rest was fine, we did a lot of presentations, but a lot of your input was missing. So, you take us to this level, then you put more input in the end. Then you have a conclusion, so that's make a super workshop.
- G1 (H) – Wrap it, direct it, and signposted it
- G2 (N) – People are very very very much educated that you might get, they might be you know. We really didn't understand.
- G2 (C) – You brought them here, and give them a really negative experience. No way, they will feel miserable, and you don't wanna do something else, afterwards, because it didn't do anything for them.
- G2 (A) – If you combine this together, I don't think is long as it has to be.
- G1 (H) – Also make sure time (Leon)
- G2 (N) – It was a really constructive feedback. People from different background. I've seen the way you constructed the workshop, which is good. When you sit back and you see. We also were talking about a lot of resources that you put in, which would cost you more. So, I might question again when I was doing it privately, I used to cut down the resources. Then you need less and less resources. You don't need to print this many things, instead of three pitches, you could give us one page. I don't need to be coloured. We were talking about three different pages.
- G2 (A) – The whole thing doesn't need all the colour coding. Unless you are colour coding in a single page to focus understandings across them. If you have three colours in single sheet. Otherwise, single colour won't make any difference. Overall, I would write it down: Have a look on the tool, out of from different

areas, I don't need more than black paper and direction. I think overall, I would try to work out how basic information I can collect, If you make more and more basic.

- Good point: Nice and easy relationship!

Debrief

- The bit I got confused
- You were saying with people by people to solve their problem. I didn't know whether or not you meant the group, are we the people or are we in this workshop solving a problem or imagining we are practitioners, and we have to solve them, or we are imagining being a participant, are we solving a problem with the tool. It is an end-user problem, we have to design a new library? **DEFINE THE ROLE in the scenario.**
- If you lay out the ontology, we might do it visually. This isn't happening in the real world but for today, here is leapfrog, here is practitioner, and they want to work with this group
- Part of the reason the task was so hard. I didn't know what the tool would be for. You could construct the scenario: We are going to imagine, you guys are going to facilitate, you are going to work with young people, to figure out this.
- You might get people to construct their own scenario or agree, or you might give them one. But, I think it's not clear what the word problem refers to, until you say. This would really help.
- Andy's group had the tagline of the tool, on the tool. They were much more ready able to get into it, whereas in my group, Claire didn't know what was the tool for? Where is the instructions? Then they came out. Either group get the tagline or both should. This would make a big difference.
- Other thing is that plan B is designed for use of everyone equal, everyone is planning, whereas target support there is someone planning and facilitating. **The tools are not equal in that respect.** One is designed for people who don't care, the others is design to help people who do care, that miss match. I'm not saying you need to change the tools. One is about to get feedback, the other is your team. It's worthy to think about if they are equal. If you did have the ontology, where you got "here is a group of people planning the event", here is a group of people who are gonna to come, then you could clearly describe, where the tool fit.
- We didn't follow the feedback on the three stages, and we meant to pass through them. I suspect the discussion you want people through these stages was quite difficult. It's just finding a way to make the overall. I would say, those three categories are part of your theory, whether they need to be present. If they are present, do they need to bring your theoretical language. These are for design researcher, but the participants, they might not be used to use theory. Share just the ideas, that's cover everything.
- We talk through the interference of terms, whose problems they are, but when we got to the final task: I didn't follow the theory on the way, it's really hard to evaluate it.
- Your categories, I struggled with 1 and 2, but the third one did seem distinct, because the first two are about what the is like NOW, and what can it do beyond that. You might do a separation what you can do now, and what could it do. It depends, if you are interested how people improve, do something different,

apply your theory on what they did. Rather than put your theory into it. If you are interviewing people, if you are following right interview practice, you wouldn't ask them to adopt your theoretical language in an interview, you would ask them to speak in their own language, and you would have some entry points, it might mean you should build towards theoretical interpretation, not the outcomes, rather than say well. If not, Leon might said this to you, do on your risk of "my theory is confirmed by workshops, but the examiner will say you put your theory in the workshop, how could it not come from it?". Try to find a way to say those three categories, to make it more interesting.

Task 1 – Everybody

Improve It

Can you give suggestions to improve the tool?

- * Highlight the men } → shows they are part of the process - tool
- * Take the steps guide off the bottom put the box headings in the box, gives more space, can spread them out. Have more "men" → not enough happy people.
- * Do not like Secret, implies no-one else will see it. misleading, heading too many words
- * Do not like dimension of need,
- * What is important to you → can use tool in all CSC teams then.

Can you review the wording used in the tool, and highlight the words you wish you could change?

Task 2 – Storyboard contract

Task 2

**Can you use the tool and explore the design of material?
Highlight where you wish you could change it**



Can you give suggestions to improve the tool?

Improve It

- * Less S for older Children
more scope to make it their own.
- * Stickers → Use Emoji for older Children
as in social media
- * Stickers (current) are good for younger Children
- * Text
- * Good for ILO's to use.

Task 2 - Everybody

Task 2

**Can you use the tool and explore the design of material?
Highlight where you wish you could change it**

WORDS OF POWER
MAYBE TOO CHILDISH?
TOO BOLD?
ACTUAL EMOTIONS ON THE BOARD

THINK THIS HAS BEEN DESIGNED FOR YOUNGER CHILDREN

Improve It

Can you give suggestions to improve the tool?

- IF USED IN EDUCATIONAL ENVIRONMENT HAS BETTER CHANCE OF WORKING.
- USE ACTUAL EMOJI'S INSTEAD OF HAVING TO WRITE - SOME MAYBE DON'T EVEN HAVE A PEN IN THEIR HOUSE!
- MAYBE GET RID OF THE ENVELOPE OR DON'T SHOW IT TO THE YOUNG PERSON.
- GRAPHICS & COLOURS ARE RELATIVELY FEMININE.

Task 2 – Topic Tally

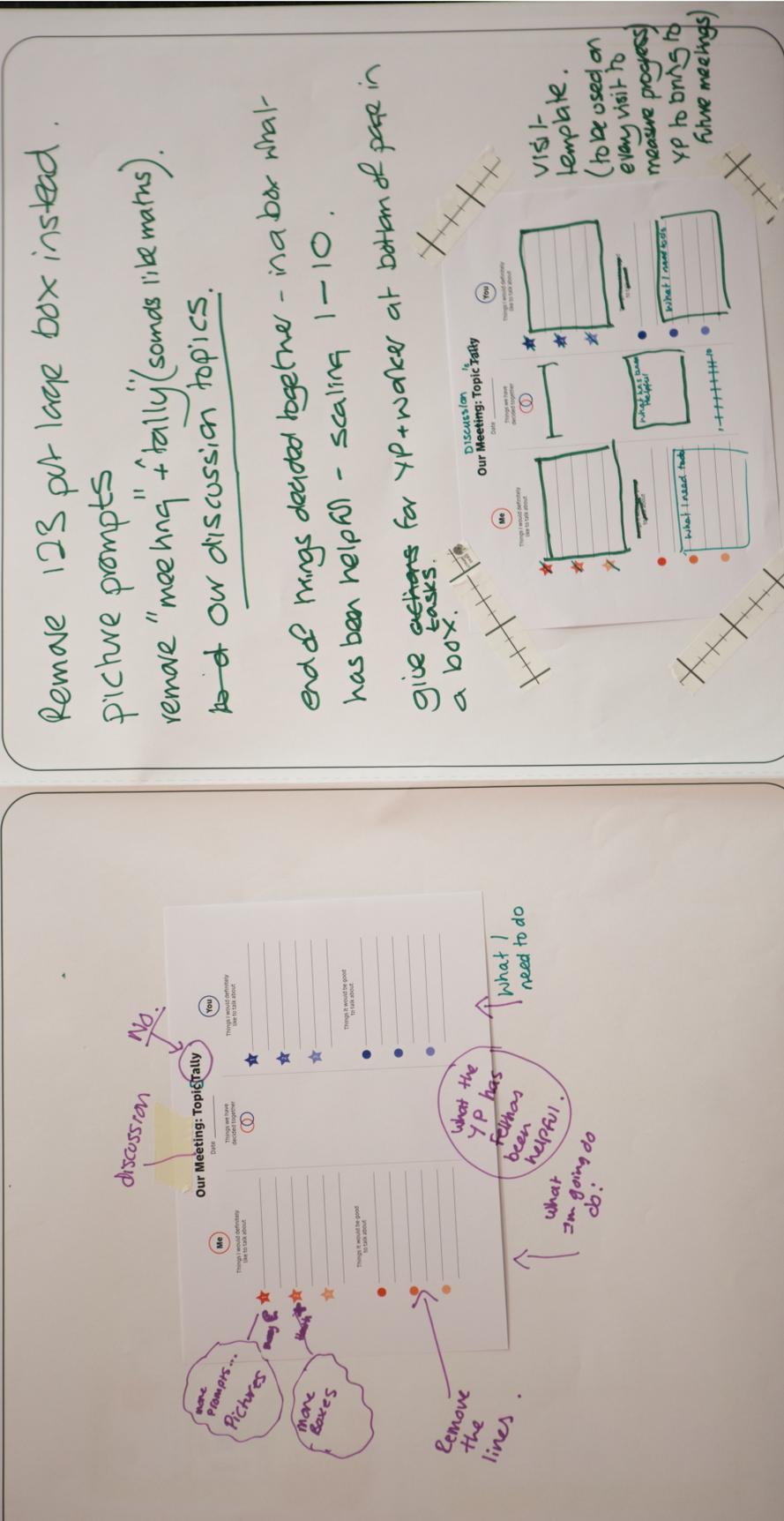
Improve It

Can you give suggestions to improve the tool?



sk 2

you use the tool and explore the design of material?
might where you wish you could change it



Remove 123 put large box instead.
 picture prompts
 remove "meeting" + tally (sounds like maths).
to do our discussion topics.
 end of things decided together - in a box what has been helpful - scaling 1-10.
 give options for YP + worker at bottom of page in a box.

DISCUSSION: TOPIC TALLY

What I'm going to do: what the YP has found helpful.

Remove the lines.

What I need to do

more Prompts... Pictures

more boxes

discussion

What I'm going to do

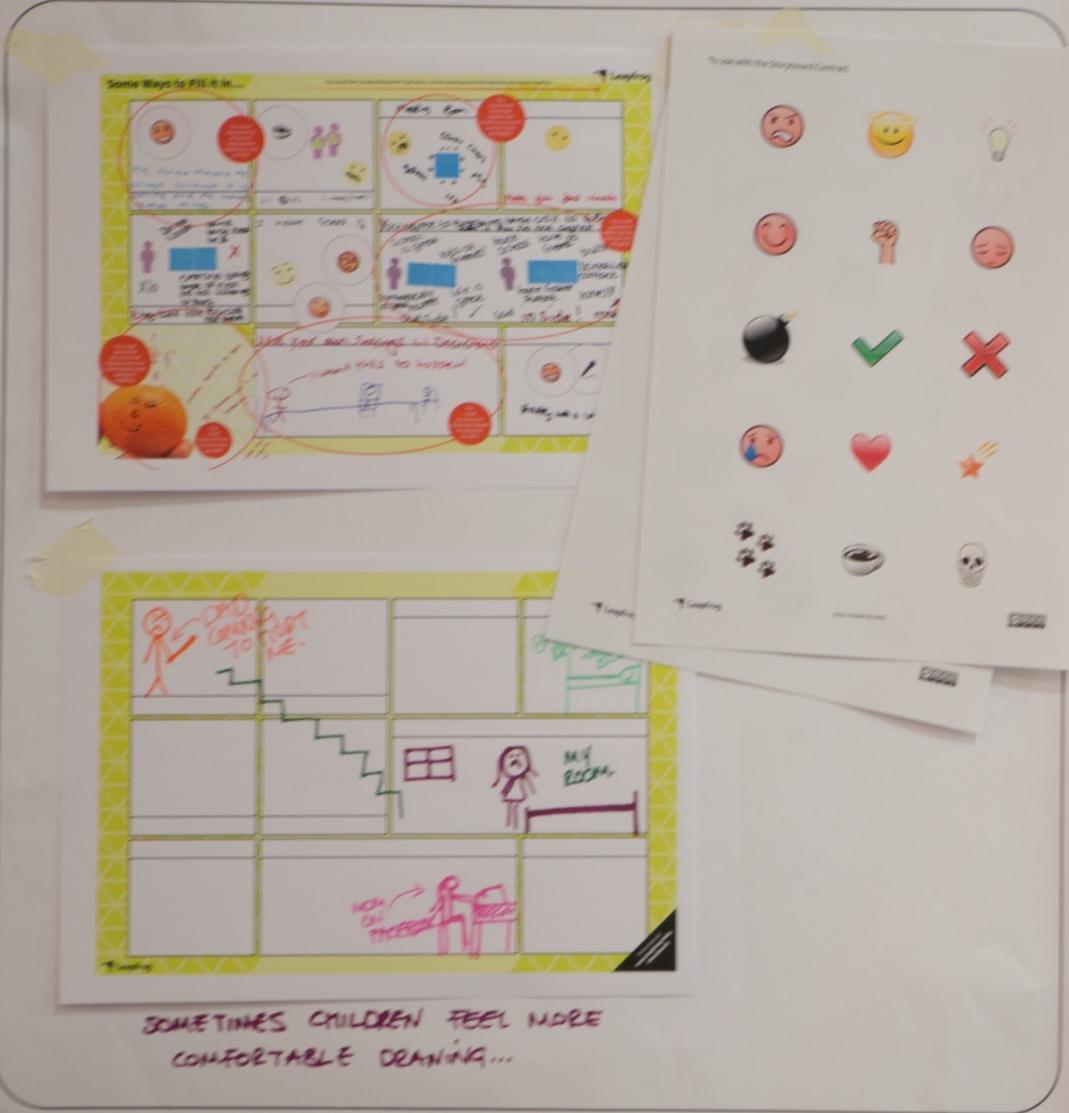
What I need to do

visit template. (to be used on every visit to measure progress) YP to bring to future meetings

Task 3 – Storyboard contract

Task 3

Can you use the tool in a way it was not intended to be used, and highlight where you wish you could change it?



SOME TIMES CHILDREN FEEL MORE COMFORTABLE DRAWING...

Task 3 - Everybody

Task 3

Can you use the tool in a way it was not intended to be used, and highlight where you wish you could change it?

Needs to be simplified + meaningful.
Pilot transition from completion to pathway plan.

Improve It

Can you give suggestions to improve the tool?

- Pathways plans are not user/person friendly
- 3 parts long:
 - 1) Meeting Summary discussed (with headings to work from) go through plan which has been agreed or not
 - 2) Needs Assessment (particularly unfriendly long + laborious does not look at or fit needs of YP + v. repetitive. At back is analysis looking at every aspect of pathway plan + write a new plan on basis of the info from analysis (with contingency for each subject))

A FRIENDLY PLAN: needs/actions emergency

Task 3 – Topic Tally

Task 3

Can you use the tool in a way it was not intended to be used, and highlight where you wish you could change it?

1) ASSIST WITH PATHWAY PLANNING
——||——
REVIEWS

(2) PREPARE
(3) INFORMATION SHARING
(4) REPRESENTATIVE OF VIEWS (8) USER FRIENDLY.
(5) WIKES & FEEDBACKS -

(6) TASK CENTRED.
(7) NOT OVERLAPPING
(9) ASSIST WITH DECISION MAKING

(10) FLEXIBLE

MOMO
mind of
my own.

PLAN!
Our Meeting Topic Tally

DATE: _____

MEMBERS: _____

ACTIONS:

TIME: _____

WHO: _____

WHEN: _____

WHERE: _____

✓

★

★

★

●

●

●

(1)

Evaluation sheets

<p>Topic Tally</p> <p>Rate each set of proposals using stars out of 5, and if you like share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 Words</p> <ul style="list-style-type: none"> To formally worded. Better as an app. Scaling System Actions (what we will do, what they will do) 	<p>THE STRAIGHTFORWARD COMMENT</p> <p>Rate each set of proposals using stars out of 5, and if you like share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 Words</p> <p>Into 3 boxes, changed wording - based on 3 Houses Model</p>	<p>EVERYBODY</p> <p>Rate each set of proposals using stars out of 5, and if you like share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 Words</p> <p>Time specific</p> <ul style="list-style-type: none"> Very process driven Remove the steps guide Too busy / too many words workable for younger children (perhaps?)
<p>Task 2 Design of material</p> <ul style="list-style-type: none"> No boxes (would be better) remove lines Picture prompts Process driven 	<p>Task 2 Design of material</p> <p>Too 'boxy'. Overwhelming. more simplistic good for 160 to use evolving tool for differing ages</p>	<p>Task 2 Design of material</p> <ul style="list-style-type: none"> Too boxy - make it more adaptable re less boxes, one large box. social media icons / FB / Snapchat
<p>Task 3 Flexibility</p> <ul style="list-style-type: none"> Less is more Generic 	<p>Task 3 Flexibility</p> <p>Changed into 3 house Model Too busy not easy to engage with Use for drawing in easy engis need to be more appropriate for age</p>	<p>Task 3 Flexibility</p> <ul style="list-style-type: none"> Time specific Less is more Very adaptable for different formats

Appendix F - Pilot Study 2: Transcriptions of proformas and evaluation sheets

STAGE 1 – Words

	Can you review the wording used in the tool, and highlight the words you wish you could change?	Can you give suggestions to improve the tool?
Everybody	<p>(What you write and draw...) Too wordy (Secret) → Not appropriate in CIOC (Children in our care) → misleading (In the Cloud) → Idea/Question (In the Heart) → Feeling (Think about) → Need v Want (Arrow) How to make this happen (Instructions) → Too much</p>	<p>Highlight the men, darker → shows they are part of the process – tool Take the steps guide off the bottom put the box headings in the box, gives more space, can spread them out. Have more “men” → Not enough happy people. Do not like secret, Heading too many words Do not like dimension of need</p> <p>What is important to you > can use tool in all CSc teams then</p>
Storyboard	<p>What I would like from “MY” meeting Discussion rather than meeting (Dream meeting) No dream meeting due to past experiences Meeting? Formal word</p>	<p>What is working well for you? What is not working well? What needs to change improve things (Everybody squares split in three) What I would like from “MY” meeting</p>
Topic tally	<p>Too many words on the sheet. Less is more (Things I would definitely talk about) → Things I need to talk about (Things it would be good to talk about) → Things I want to talk about (Our meeting: Topic tally) → Change of title? Too formal Eg. Today’s visit (Thing I would definitely like to talk about) → Need to talk about Things it would be good to talk about → Want to talk about Things it would be good to talk about → Want to talk about Wrong format... Care leavers don’t tend to like pen & paper exercises</p>	<p>Form on paper represents statutory authority</p> <p>Things I need to talk about Things I want to talk about</p> <p>Maybe different format? Maybe an app</p>

STAGE 2 – Design of material

	Can you review the wording used in the tool, and highlight the words you wish you could change?	Can you give suggestions to improve the tool?
Everybody	<p>(Secret) Trigger word for a lot of youngsters Maybe too childish? Too formal (Instructions) Too wordy Actual emotions to use on the form (Creative commons) - What does this mean? Think this has been designed for younger children Logo may be too formal What environment is this being piloted in?</p>	<p>If used in educational environment has better change of working</p> <p>Use actual emoji's (emotions) instead of having to write – Some maybe don't even have a pen in their house</p> <p>Maybe get rid of the envelope or don't show it to the young person.</p> <p>Graphic & colours are relatively feminine</p>
Storyboard	<p>Not all needed More scope to make you own Different options ie: younger children more – older less/one box</p>	<p>Less box s for older children. More scope to make their own Stickers → Use emoji for older children as in Social media Stickets (current) are good for younger children Text Good for IRO's to use</p>
Topic tally	<p>More prompts... Pictures More boxes Remove the lines (Meeting) → Discussion Topic(S) Tally → NO (Things it would be good to talk about) → What I'm going to do (Things it would be good to talk about) → What I need to do What the YP has felt has been helpful</p>	<p>Remove 123 put large box instead Picture prompts Remove "meeting" + "tally" (sounds like maths) <u>Our discussion topics</u></p> <p>End of things decided together – in a box > what has been helpful – scaling 1- 10</p> <p>Give tasks for YP + worker at bottom of page in a box.</p> <p>Visit template. (To be used every visit to measure progress) YP to bring to future meetings</p>

STAGE 3 – Flexibility

	Can you review the wording used in the tool, and highlight the words you wish you could change?	Can you give suggestions to improve the tool?
Everybody	<p>Needs to be simplified + meaningful (use) First transition from careplan to pathway plan Pathways plan tool! Non anonymised (education employment training) (Think about) Specific subject: EET (NEET Need Educational and Training) Finance, Accommodation, Wellbeing + health. Mental health (Think about) What does this mean? Images not clear YP learning needs. This does not tell you the purpose (Instructions) Plan needs to be mentioned (Instruction 1) Where’s the circle? (Instruction 2) What do you want to do. (Instruction 3) How do you feel about this (ie Imagine you are 18) (Envelope) (Icon) or sticker (Envelope) What does this mean? A name? why? (Envelope) What are we using it for? (Envelope) If it’s anonymous what’s the point?</p>	<p>Pathways plans are not user/person friendly</p> <p>3 parts long:</p> <ol style="list-style-type: none"> 1) Meeting summary discussed (with headings to work from) <ul style="list-style-type: none"> • Go through plan what’s been saved or not 2) Needs assessment (particularly unfriendly) <ul style="list-style-type: none"> • Long + laborious does not look at a fit needs • Of YP + v. repetitive. At back is analysis looking at every aspect of pathway plan + write a new plan on basis of the info from analysis (with contingency for each subject) <p>A fridge plan: nds/actions emergency</p> <p>3)</p>
Storyboard	<p>Sometimes children feel more comfortable drawing</p>	
Topic tally	<p>Assist with pathway planning reviews Prepare Information sharing Representative of views Wishes & feelings Task centred Not overlatems User friendly Assist with decision make Flexible</p> <p>Our meeting: Topic tally Plan! Things I would definitely like to talk about Things we have decided together Actions 1. Time 2. Who 3. When 4. Where Bottom page strikethrough</p>	<p>1. MOMO mind of my own</p>

RE-EVALUATION: TRANSCRIPTION PER TASK

Task 1: Words

Score	Improvement	Presentation
Everybody 1	Very process driven Remove the steps guide Too busy / Too many words Workable for younger children (perhaps?)	It is quite generic in terms of what is suggested or recommended But we felt like the dimension of need, it is very much process driven. Take out the steps guide in the bottom of the page, allowing to get more space And the term secrets imply that no one else will see, maybe misleading Again, too many words, too busy
Storyboard 2	Into 3 boxes, changed wording – Based on 3 houses model	We put into three boxes really We've changed the wording of it, so it's not a meeting. It's a discussion, we've sort of asking like what is working well for you, and what's not working well, and what needs to change to improve things. It's a bit of the three houses really. It's just we didn't like the boxes. We thought it could be more simplified, into three specific areas. Because otherwise, it's not clear. It's not even a cartoon, it does not really flow, it's not telling you what you need to be doing.
Topic tally 3	To formally worded Better as an app Scaling system Actions (What we will do, what they will do)	We said that this "things we need to talk about" and "things we want to talk about". We said it's kind of presents too formal, and the fact it's says tally, it feels like more academic. Maybe it's in the wrong format because I know my care leavers will not sit and write in a piece of paper in a meeting. Maybe and app or something like that.

Task 2: Design of material

Score	Improvement	Presentation
Everybody 2	Too boxy – Make it more adaptable ie. Less boxes, one large box Social media icons / FB / Snapchat	We thought that if it's used in an education environment it will better than in one-to-one environment, better chance to be working cos lot of kids just won't wanna do it. They just, you know, have to direct work session, it just won't get done. We like the idea of emojis but felt like the emojis have to be really appropriate. You know to have a ghost or a violin it's got to be also like emotional led, with expressions, get rid of the envelope. I think the envelope is always suspicious specially when it got logos "where is this going?". We felt like the graphics and colours are relatively feminine, and should be more sort of generic maybe androgynous looking form. It is more appropriate for younger children or children we just not engage with. It's too wordy.
Storyboard 1	Too "boxey" Overwhelming More simplistic Good for IRO to use Evolving tool for different ages	Whispering (It was too boxey) I think we said it was too boxey, for young children it would be fine, like loads of boxes and it's fun to talk about themselves, but teenagers don't have the time, or won't have time to try fill in 8 boxes, it's overwhelming. It's not clear what it does, They look at questions like "How long do I have to be here for?" or "What do you want me to write in the boxes?". What they need is, don't need to be that big, it could be

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		<p>more simplistic, maybe one box, and they can separate into this I wanted to</p> <p>Probably something IROs to do in oppose to us</p> <p>And Social media tools and technologies something that is very savvy and it have to be an involving tool</p> <p>These are lovely for practical children, because they are traditional outcomes</p> <p>But they are not good for teenagers, they are very baby.</p> <p>Teenagers will look at that and think it's an age inappropriate</p>
Topic tally 2	<p>No boxes (would be better) remove lines</p> <p>Picture prompts</p> <p>Process driven</p>	<p>(When we asked Group 1 to talk about this) I'm confused</p> <p>We didn't like the numbers and the boxes, so we've said you should move the line from it, otherwise YP might fill something in each one</p> <p>The sort as well, we sort of agree like "tally" sounds like maths, and it should be our discussion.</p> <p>And maybe pictures, prompts like "things you would definitely talk about" because it depends on what is the meeting about. You could have like images that could be money or health or relationships just to give them an idea what they wanna talk about,</p> <p>And then we said about the end of it (bottom)</p> <p>Asking the young person what the YP would say is helpful when having a discussion, whether they've been working with.</p> <p>And then we could use a scaling system 1-10, so they might be coming and fill in say about something like "you are going to make me homeless", and you are going to do with them, and at the end, they might they are 5 instead of 2 when they came in, but they have actions to do in the end. So, what they need to do, and what you are going to do.</p>

Task 3: Flexibility

Score	Improvement	Presentation
Everybody 2	<p>Time specific</p> <p>Less is more</p> <p>Very adaptable for different formats</p>	<p>It's sort of similar what everybody else were saying.</p> <p>We didn't like the envelope. What does it mean, where is this going? If it's anonymous what's the point of filling in</p> <p>The envelope goes from very fun to very serious, and then you have the four characters, but on the picture there is only three, so where is the circle where is supposed to go. By asking me, we found out that these images are in the grey, it's not clear at all.</p> <p>Depending to the YP needs, learning needs. What some adults mean it's just not clear at all, so</p> <p>A dimension of need of the pathway planning process is like "what on earth is that mean?". It's just not clear, it should be specific subject like: finance, accommodation, wellbeing and health. It can certainly talk about one to one on specific thing. It needs to be simplified, and meaningful.</p> <p>We started to think it should be good for start transition from care plan to pathway plan. We've used basic tools.</p>
Storyboard 1	<p>Changed into 3 house model</p> <p>Too busy not easy to engage with</p> <p>Use for drawing in</p>	<p>We've change this one into a tool we use all the time houses.</p> <p>What is going on, because pictures and pics thousands of words for me that's how I work, kids don't always want to verbalise, and I don't know I just couldn't engage with this, it's too busy. I just look at it and it looks awful.</p>

	Emojis need to be more appropriate for ages	Kids feel more comfortable drawing and simiilalise with the emojis. Well, not appropriate, not reflective
Topic tally 3	Less is more Generic	It's sort of similar what everybody else were saying. We didn't like the envelope. What does it mean, where is this going? If it's anonymous what's the point of filling in The envelope goes from very fun to very serious, and then you have the four characters, but on the picture there is only three, so where is the circle where is supposed to go. By asking me, we found out that these images are in the grey, it's not clear at all. Depending to the YP needs, learning needs. What some adults mean it's just not clear at all, so A dimension of need of the pathway planning process is like "what on earth is that mean?". It's just not clear, it should be specific subject like: finance, accommodation, wellbeing and health. It can certainly talk about one to one on specific thing. It needs to be simplified, and meaningful. We started to think it should be good for start transition from care plan to pathway plan. We've used basic tools.

RE-EVALUATION: TRANSCRIPTION PER TOOL/Presentation

Everybody

Score	Improvement	Presentation transcription
Words 1	Very process driven Remove the steps guide Too busy / Too many words Workable for younger children (perhaps?)	It is quite generic in terms of what is suggested or recommended But we felt like the dimension of need, it is very much process driven. Take out the steps guide in the bottom of the page, allowing to get more space And the term secrets imply that no one else will see, maybe misleading Again, too many words, too busy
Design of material 2	Too boxy – Make it more adaptable ie. Less boxes, one large box Social media icons / FB / Snapchat	We thought that if it's used in an education environment it will better than in one-to-one environment, better chance to be working cos lot of kids just won't wanna do it. They just, you know, have to direct work session, it just won't get done. We like the idea of emojis but felt like the emojis have to be really appropriate. You know to have a ghost or a violin it's got to be also like emotional led, with expressions, get rid of the envelope. I think the envelope is always suspicious specially when it got logos "where is this going?". We felt like the graphics and colours are relatively feminine, and should be more sort of generic maybe androgynous looking form. It is more appropriate for younger children or children we just not engage with. It's too wordy.
Flexibility 2	Time specific Less is more Very adaptable for different formats	It's sort of similar what everybody else were saying. We didn't like the envelope. What does it mean, where is this going? If it's anonymous what's the point of filling in The envelope goes from very fun to very serious, and then you have the four characters, but on the picture there is only three, so where is the circle where is supposed to go. By

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		<p>asking me, we found out that these images are in the grey, it's not clear at all.</p> <p>Depending to the YP needs, learning needs. What some adults mean it's just not clear at all, so</p> <p>A dimension of need of the pathway planning process is like "what on earth is that mean?". It's just not clear, it should be specific subject like: finance, accommodation, wellbeing and health. It can certainly talk about one to one on specific thing. It needs to be simplified, and meaningful.</p> <p>We started to think it should be good for start transition from care plan to pathway plan. We've used basic tools.</p>
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Storyboard Contract

Score	Improvement	Presentation transcription
Words 2	Into 3 boxes, changed wording – Based on 3 houses model	<p>We put into three boxes really</p> <p>We've changed the wording of it, so it's not a meeting. It's a discussion, we've sort of asking like what is working well for you, and what's not working well, and what needs to change to improve things. It's a bit of the three houses really. It's just we didn't like the boxes. We thought it could be more simplified, into three specific areas. Because otherwise, it's not clear. It's not even a cartoon, it does not really flow, it's not telling you what you need to be doing.</p>
Design of material 1	Too "boxey" Overwhelming More simplistic Good for IRO to use Evolving tool for different ages	<p>Whispering (It was too boxey)</p> <p>I think we said it was too boxey, for young children it would be fine, like loads of boxes and it's fun to talk about themselves, but teenagers don't have the time, or won't have time to try fill in 8 boxes, it's overwhelming. It's not clear what it does,</p> <p>They look at questions like "How long do I have to be here for?" or "What do you want me to write in the boxes?". What they need is, don't need to be that big, it could be more simplistic, maybe one box, and they can separate into this I wanted to</p> <p>Probably something IROs to do in oppose to us</p> <p>And Social media tools and technologies something that is very savvy and it have to be an involving tool</p> <p>These are lovely for practical children, because they are traditional outcomes</p> <p>But they are not good for teenagers, they are very baby.</p> <p>Teenagers will look at that and think it's an age inappropriate</p>
Flexibility 1	Changed into 3 house model Too busy not easy to engage with Use for drawing in Emojis need to be more appropriate for ages	<p>We've change this one into a tool we use all the time houses.</p> <p>What is going on, because pictures and pics thousands of words for me that's how I work, kids don't always want to verbalise, and I don't know I just couldn't engage with this, it's too busy. I just look at it and it looks awful.</p> <p>Kids feel more comfortable drawing and simiialise with the emojis.</p> <p>Well, not appropriate, not reflective</p>

Topic tally

Score	Improvement	Presentation transcription
Words 3	To formally worded Better as an app Scaling system Actions (What we will do, what they will do)	We said that this “things we need to talk about” and “things we want to talk about”. We said it’s kind of presents too formal, and the fact it’s says tally, it feels like more academic. Maybe it’s in the wrong format because I know my care leavers will not sit and write in a piece of paper in a meeting. Maybe and app or something like that.
Design of material 2	No boxes (would be better) remove lines Picture prompts Process driven	(When we asked Group 1 to talk about this) I’m confused We didn’t like the numbers and the boxes, so we’ve said you should move the line from it, otherwise YP might fill something in each one The sort as well, we sort of agree like “tally” sounds like maths, and it should be our discussion. And maybe pictures, prompts like “things you would definitely talk about” because it depends on what is the meeting about. You could have like images that could be money or health or relationships just to give them an idea what they wanna talk about, And then we said about the end of it (bottom) Asking the young person what the YP would say is helpful when having a discussion, whether they’ve been working with. And then we could use a scaling system 1-10, so they might be coming and fill in say about something like “you are going to make me homeless”, and you are going to do with them, and at the end, they might they are 5 instead of 2 when they came in, but they have actions to do in the end. So, what they need to do, and what you are going to do.
Flexibility 3	Less is more Generic	We pretty much agreed as a group that we’ve changed sits and tables, it’s a pretty much general looking sense, and some of the things we raised is pretty much the same across the three tables. In respect of the task three, we feel sometimes that “less is more” Some information on here in terms of, you know, we don’t need 6 or 7 ways to describe what it needs to be... it needs to be more generic in terms of across the board, it depends on the child or young person, age and level of understanding particular. Also, one of the things we felt it was important was that to list rather to put things, we have to decide to do together. Then you put the actions of who does what, when, where and how. If that works to different young people I work with, that would assist with some elements to tweak pathway plans and reviews. Also needs to be rolled out to part ner eighties (7:25) to ensure the all fellow suit it can be used task centred It’s not overwhelming Very specific It’s very flexible Suits decision making

Appendix G - Case Study 1: Completed proformas

Task 1 - Comms stretcher and focus

Task 1 

Can you **critique the instructions** on how you **address the challenge with the tool**? **Highlight** where you wish you could change it.

CHALLENGE:

1. Restrictive in terms of brainstorming opportunities
- An Ability to contextualize bases on Audience
2. Limiting the primary research needed to speak to a specific Group
3. Lacks Ability to synthesize communication strategy
4. Language might alienate
5. Needs to be more generative

Improve it

Can you **reimagine the instructions** and **give suggestions** to improve it?

1. Don't put media channels before the user
- 2.
- 3.
4. Prompt cards to stimulate discussions
5. Add Multi-Media features (photos, words, words, comments etc)

Task 1 – Customer flow

Task 1

Can you **critique the instructions** on how you **address the challenge with the tool**? **Highlight** where you wish you could change it.

CHALLENGE:

CRITIQUE: COMMUNITY MAP
EXTRA = RIGID (LINEAR)
[WOULD BENEFIT FROM MORE OPEN/FLEXIBLE SYSTEM (<100% 'BOXED IN')]

CRITIQUE: INTUITIVE DESIGN
ISN'T 100% INTUITIVE...
E.G. WE HAD TO FIGURE OUT HOW TO USE THESE 'INTUITIVE' TOOLS.

CRITIQUE: DIVERSITY OF PERSONS
(CHARACTER / CONS.) IS GOOD, BUT POSSIBLY NOT OPTIMAL FOR PERSONAL REPRESENTATION.
(REINFORCE BIAS?)

Improve it

Can you **reimagine the instructions** and **give suggestions** to improve it?

Sketch The Person (yourself)

- REPRESENT YOURSELF SOMEHOW
- (OR ANONYMOUS DRAWING / SIGNATURE)

Task 1 - Building success

Task 1 

Can you **critique the instructions** on how you **address the challenge with the tool**? **Highlight** where you wish you could change it.

CHALLENGE:

Challenge 2: Understanding Building Use and Resources

Creating an adaptable method, which **enables decisions to be made as to how services are to live together and to enable heads of services to know what is required to facilitate this**. A toolkit with different topics will be created to share the ~~day to day~~ decision-making with regards to the use of the building i.e. Storage space, kitchen protocol. Creative ways of problem solving.

** BUILDING BRICKS GUIDELINES NEED MORE INSTRUCTION*

** "TEAM ACTIVITY EXAMPLE" IS A CONFUSING HEADING*

HELP HEADS OF SERVICES TO COMMUNICATE EFFECTIVELY

HELP ORGA SERVICES IN BUILDING RUN TOGETHER

Building Bricks Guidelines

The bricks are a **template** for the things a team needs to consider for working together effectively in a building. The team should come up with their own headings and sub-headings for the categories and an ability to help them work together. This sheet contains examples you can use but the challenge you to think of your own.

Team Activity Example
Using the description to identify things such as emergency exits/fire extinguishers.

Keeping Safe
Health & Safety

Team Activity Example
A Google Doc/ type document which lists all equipment in the building. Any new equipment which is needed. Create a booking calendar to make a booking diary for equipment.

Bits & Bobs
Resources & Equipment

Team Activity Example
List of where to find premise management documents. If digital this would include hyperlinks.

Keeping Legal
Premise Management

Activity Example
Establishing ground rules/social contract around the building.

Brews & Brooms
House Keeping

Improve it

Can you **reimagine the instructions and give suggestions** to improve it?

** PROVIDE INSPIRING EXAMPLES*

** USE MORE IMAGES OF HOW THIS MIGHT WORK*

** REVIEW LANGUAGE USED IN GUIDELINES*

** PROVIDE MORE INSTRUCTION ON ACTIVITY*

** REDESIGN BRICK TEMPLATE*

** IMPROVE VISUAL DESIGN OF BUILDING TEMPLATE*

SPACE  *NO FOLD*

idea

Task 2 - Comms Strecher

Task 2 

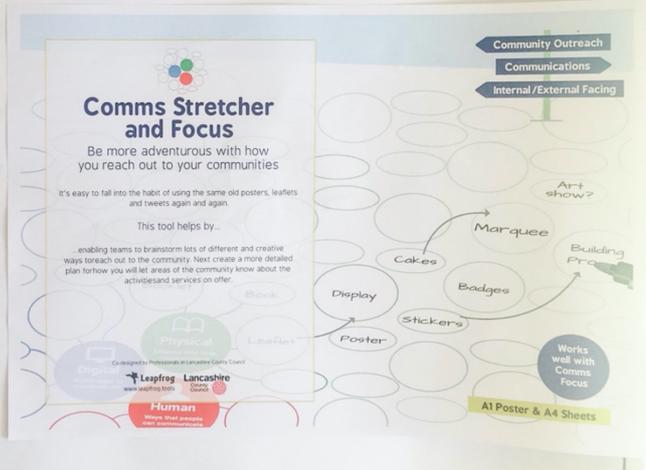
Can you **explore the design concept** of the tool?
Highlight where you wish you could change

CHALLENGE:

A CRITIQUE:
DESIGNED TO HAVE MOST IMPORTANT NOTES AT CENTRE?
BUT GROUP DYNAMICS SUGGEST THAT PEOPLE INPUT MOST IMPORTANT PARTS AT RANDOM LOCATIONS

B Connections are Seen.

C The layout might be awkward - using (overwriting) chaotic



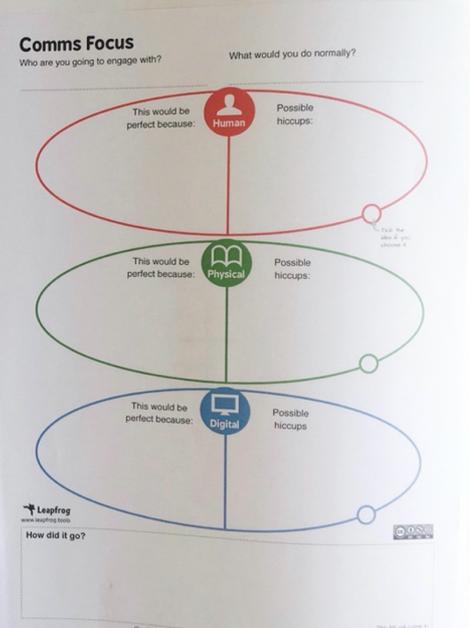
Improve It

Can you **give suggestions** for the **redesign** of the tool?

A. EXTRA CLEAR VERBAL + AURAL INTRODUCTION / EXPLANATION FOR LOGIC OF TOOL (E.G. CIRCULAR/CENTRAL FOR REASON OF...)

B. But if it was more fluid, Drawing PARTICIPANTS ARE AND Drawing Connections themselves. (E.G. TOOL DOESN'T ASSUME RESTRICTING)

C. Links to B



Task 2 – Flow

Task 2 

Can you **explore the design concept** of the tool?

Highlight where you wish you could change

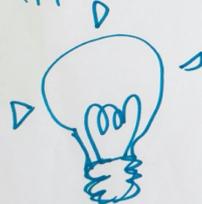
CHALLENGE:

- * PROVIDE INSTRUCTION ON WHEN / HOW LONG TO USE TOOLS
- * GIVE OVERVIEW OF TOOLS

Improve It

Can you **give suggestions** for the **redesign** of the tool?

- * THINK ABOUT HOW TO SHARE "FLOW CUSTOMER MAP" ACROSS OTHER SERVICES
- * IMPROVE VISUAL DESIGN OF TOOLS
- * PROVIDE ROLE DESCRIPTIONS FOR THOSE USING THE TOOL WITHIN THE TEAM



Task 2 – Building success

Task 2

Can you **explore the design concept** of the tool?
Highlight where you wish you could change

CHALLENGE:

SEEMS ONE STEP REMOVED - buildings needs to be experienced directly

People live relationally in this space - too abstract.

No Clearly Defined Roles for individuals

Not embodied interaction with place

The analogy of bricks don't work - they are external.

Some steps are confusing

Building may not look like this
Purple - designer has coloured the view of building

Not About An Actual physical space, or location

improve it

Can you **give suggestions** for the **redesign** of the tool?

Draw the map collaboratively - of the space.

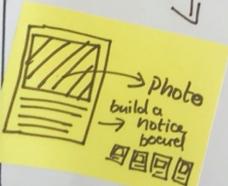
Prime Exercise w/ various Activities
or
Brainstorm w/ Group Activities which take place in the shared space

SENSING CARDS with words + colours to suggest places in the building that have different moods

Giving clear indication about each steps

TEMPLATE of People in the space take pictures with a comment area to build feelings + expression about place

Assume Different Roles to build Shared Understanding



Task 3 – Comms stretch

Task 3

Can you **explore unexpected applications** for the tool?

Describe different ways the tool could be applied if you could change it.

* COULD ALSO BE USED TO COMMUNICATE WITHIN / ACROSS ORGANISATIONS (NOT JUST GENERAL COMMUNITY)

* CREATE DIGITAL VERSION OF TOOL
↳ CONNECT COMMUNITIES / ORGANISATIONS THAT ARE FAR APART

Improve it

Can you **give suggestions to accommodate** different applications?

~~Provide sticker to change~~
3 HEADINGS to use it for other's idea collection.

D *

Task 3 – Flow

Task 3 

Can you **explore unexpected applications** for the tool?

Describe different ways the tool could be applied if you could change it.

PERSONAS
COULD HAVE
ARROWS
BETWEEN EACH
OTHER

Time based
Customer
flow within
A shared space

To Experience
Different roles
&
Extend Empathy

DOSN'T
~~GET~~ Take
into account
non-human
actors

TOO -
HUMAN
CENTRED

Improve it

Can you **give suggestions to accommodate** different applications?

ADD time or
other constraints
to contextualize
The tool

HAVE
FIGURES/
CHARACTURES
OF NON-
HUMAN STUFF

PERSONA'S FLATTER
PEOPLE, this is a tool
for real people in
real places



DIFFERENT
MOODS OF
PEOPLE -
TOO HAPPY



Task 3 – Building success

Task 3

Can you **explore unexpected applications** for
Describe different ways the tool could be app

- A. IDEA GENERATOR
- B. "ICE-BREAKER"
- C. UNDERSTANDING OTHER PEOPLE'S PERSPECTIVES (AND PRIORITIES)

Teaching
Tool.
Universal Pedagogy.

Improve it

Can you **give suggestions to accommo**

[A-D] THERE
COULD BE AN
ADDITIONAL DIGITAL
EQUIVALENT/VERSION
WHERE PEOPLE
NOT PHYSICALLY ABLE
TO ATTEND WORKSHOP
CAN PARTICIPATE.

~~Share~~ Share
Pack → of
Data after
Workshop.

Evaluation sheets

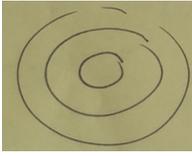
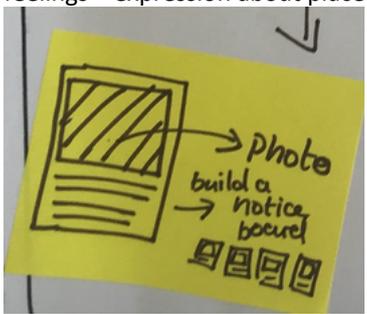
<p>TOOL: <u>Comm Stretches</u></p> <p>Evaluate the proposals</p> <p>Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 Instruction</p> <p>★★★★☆</p> <p>WASNT DELVED AS OR EXPLINED WELL ENOUGH FOR US TO UNPACK. DRAWING IN A PILE OF PAPERS CONFUSING & PRESCRIPTIVE FOR US SERVICE USERS</p>	<p>Task 2 Design concept</p> <p>★★★★☆</p> <p>Scales of impact + inter connections Between various channels</p> <p>Lacks fluidity + ability to be expressive</p> <p>Generative</p>	<p>Task 3 Resilience</p> <p>★★★★☆</p> <p>Could be tool for intergenerational communication + not just one way communication Strategy development.</p> <p>Underestimate creativity of Service Users</p>
<p>TOOL: <u>Flow</u></p> <p>Evaluate the proposals</p> <p>Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 Instruction</p> <p>★★★★☆</p> <p>CRITICUES: V.</p> <ul style="list-style-type: none"> • MORE FLEXIBILITY IN PERSONAL UNDERSTANDING + ② OF HOW TO USE TOOL [RIGIDITY CAN BE REDUCED SLIGHTLY AND/OR INCLUDE EXTRA 'NON' DEFINED SECTION]. • RANTO LACK OF SUGGESTIONS BY US (RAN OUT OF TIME). 	<p>Task 2 Design concept</p> <p>★★★★☆</p> <p>OVERALL NEEDED FOR EXPLANATIONS TO IMPROVE USABILITY OF TOOLS (HOW, HOW ONLY WHO, WHY, ETC.)</p> <p>SUGGESTION: FOR IMPROVE VISUAL DESIGN OF 'TOOLS' CAN NEEDS TO BE MORE SPECIFIC (WHAT/HOW).</p>	<p>Task 3 Resilience</p> <p>★★★★☆</p> <ul style="list-style-type: none"> • UNDERSTANDING OF ALL ASPECTS OF TOOL REQUIRED TO EXTENDED + 'DEEPER' LEVELS OF DESIGN. • EXPOSE E.G. "EXTENDING EMPATHY" POSSIBLY (WHILE OF COURSE IT NEEDED) REQUIRES MORE OPTIMAL EXERCISE FOR THIS LEVEL OF ENHANCEMENT. 1-2+ STAGE OF SAME EXERCISE (?).
<p>TOOL: <u>Building</u></p> <p>Evaluate the proposals</p> <p>Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 Instruction</p> <p>★★★★☆</p> <p>GAVE PRACTICAL INSTRUCTIONS ON HOW TO IMPROVE</p>	<p>Task 2 Design concept</p> <p>★★★★☆</p> <p>VERY INNOVATIVE AND ACTIONABLE IDEAS ON HOW TO IMPROVE TOO <</p>	<p>Task 3 Resilience</p> <p>★★★★☆</p> <p>NOT SURE HOW THE TOOL WOULD BE USED AS ICE-NEEDS TO GIVE USERS BREAKER, MORE CONTROL</p>

Appendix H - Case Study 1: Transcriptions of proformas and evaluation sheets

Task 1 – Instruction

	Can you critique the instructions on how you address the challenge with the tool? Highlight where you wish you could change it.	Can you reimagine the instructions and give suggestions to improve it?
Comms stretcher & Comms	<ol style="list-style-type: none"> 2. Restrictive in terms of brainstorming opportunities <ul style="list-style-type: none"> - An ability to contextualize based on Audience 3. Limiting the primary research needed to speak of a specific group 4. Lacks ability to synthesis communication strategy 5. Language might alienate 6. Needs to be more generative 	<ol style="list-style-type: none"> 1. Don't put media channels before the user 2. 3. 4. Prompt cards to stimulate discussions 5. Add Multimedia features (photos, words, moods, coments etc)
Customer flow tools	<p>Critique: Community map = <u>Extra</u> rigid (linear) [Would benefit from more open // flexible system (<100% 'boxed in')</p> <p>Critique: Intuitive design Isn't 100% intuitive Ex.. We had to figure out how to use these 'intuitive' tools</p> <p>Critique: - Diversity of personas ("character icons") is good, but possibly not optimal for personal representation. (reinforce bias)</p>	<p>Sketch The Person (yourself)</p> <ul style="list-style-type: none"> - Represent yourself somehow - (or anonymous drawing // signature)
Building success	<ul style="list-style-type: none"> ❖ Building bricks guidelines need more instruction ❖ "Team activity example" is a confusing heading 	<ul style="list-style-type: none"> ❖ Provide inspiring examples ❖ Use more images of how this might work ❖ Review language used in guidelines ❖ Provide more instruction on activity ❖ Redesign brick template ❖ Improve visual design of building template

Task 2 – Design concept

	Can you explore the design concept? highlight where you wish you could change it	Can you give suggestions for the redesign of the tool?
Comms stretcher & Comms	<p>A. Critique:</p> <ul style="list-style-type: none"> • Design to have most important notes at centre? • But group dynamics suggest that people input most important parts at random locations <p>B. <u>Connections one seen</u></p> <p>C. - The layout might be overwhelming chaotic</p>	<p>A. Extra clear <u>verbal</u> + Oral introduction // explanation for logic of tools (E.g. Circular // Central for reason of)</p> <p>B. But if it was more fluid, drawing</p>  <ul style="list-style-type: none"> • → • And participants are drawing connections themselves  <ul style="list-style-type: none"> • (E.g. tool doesn't assume → Restricting)
Customer flow tools	<ul style="list-style-type: none"> ❖ Provide instruction on when/how long to use tools ❖ Give overview of tools 	<ul style="list-style-type: none"> ❖ Think about how to share “flow customer map” across other services ❖ Improve visual design of tools ❖ Provide role descriptions for those using the tool within the team
Building success	<ul style="list-style-type: none"> - Seems one step removed – Buildings need to be experienced directly - Not embodied interaction with place - Building may not look like this Purple – designer has coloured the view of building - People live relationally in this space – Too abstract - The analogy of bricks don't work – They are external - No clearly defined roles for individuals - Some steps are confusing - not about an actual physical space or location 	<ul style="list-style-type: none"> - Draw the map collaborately – of the space - SENSING CARDS with words + colours to suggest places in the building that have different moods - TEMPLATE of people in the space • Take picture with a comment area to build feelings + expression about place  <ul style="list-style-type: none"> • Prime exercise w/ various activities • Or - Brainstorm w/group • Activities which take place in the shared space - Giving a clear indication about each steps - Assume different roles to build shared understanding •

Task 3 – Resilience (Flexibility)

	<p>Can you explore unexpected applications of the tool. Describe different ways the tool could be applied if you could change it.</p>	<p>Can you give suggestions on how you could redesign the tool to accommodate many different uses</p>
<p>Comms stretcher & Comms</p>	<ul style="list-style-type: none"> ❖ Could also be used to communicate within / across organisations (not just general community) ❖ Create digital version of tool <ul style="list-style-type: none"> • Connect communities/organisations that are far apart 	<ul style="list-style-type: none"> ❖ Provide sticker to change 3 headings to use it for other’s idea collection
<p>Customer flow tools</p>	<ul style="list-style-type: none"> ❖ Personas could have arrows between each other ❖ Doesn’t take into account non-human actors ❖ Too-human centred ❖ Time based customer flow within a shared space ❖ To experience difficult roles and extend empathy 	<ul style="list-style-type: none"> ❖ Add time or other constraints to contextualise the tool ❖ Have figures / Caricatures of non-human stuff  <ul style="list-style-type: none"> • • ❖ Persona’s flatten people, this is a tool for real people in real places ❖ Different moods of people – Too happy 
<p>Building success</p>	<ul style="list-style-type: none"> A. Idea generator B. Ice-breaker C. Understanding other people’s perspective (and priorities) D. Teaching tool <ul style="list-style-type: none"> • Universal Pedagogy 	<ul style="list-style-type: none"> • [A – D] There could be an additional digital equivalent // version where people not physically able to attend workshop can participate. • • Pack → Share of Data after workshop

RE-EVALUATION: TRANSCRIPTION PER TOOL/Presentation

Comm Stretcher

Score	Improvement	Presentation transcription
<p>Instruction 3</p>	<p>Wasn’t delivered or explained well enough for us to unpack. Drowning in a pile of papers confusing and prescriptive for us service users</p>	<p>Same comments</p>

A FRAMEWORK FOR IMPROVING KNOWLEDGE EXCHANGE TOOLS

Design concept 3	Scales of impact + interconnections between various channels Lacks fluidity + Ability to be expressive generative	The Scales of impact and interconnections between various channels that would be a really nice addition Lack fluidity and ability to be generative
Resilience 3	Could be tool for intersectoral communication + not just one way communication strategy development Underestimate creativity of service users	Same Underestimate creativity of service users

Building success

Score	Improvement	Presentation transcription
Instruction 3	Gave practical instructions on how to improve	We had this tool to imagine the services in the building, with the building blocks and something. I don't know if it was the first tool we looked at, I think I found the most confusing. The other two are more straightforward 4:09 so when we first worked with instruction, it needs more of work and visual design, and instruction for users, and the concept here comes back to this steps, because of a lot of interesting things here
Design concept 5	Very innovative and actionable ideas on how to improve tool	This 's really interesting this task two. We came up with really specific actionable and innovative ideas, so for example, we've got an issue with the template, that it's design-wise is intuitive, attractive or doesn't really work, that you stick these and this, it does really make sense but there is really nice ideas about how to address that, like collaboratively making this map, I thought it is really a nice idea of the space, doing stuff like, in the actual space, having templates for people can a, have comment areas, make pictures like this, and they are really nice ideas, or there. And also have a digital platform. I guess the issue of having a digital platform, it's disconnects this and somebody actually be in where they work, somebody's space where they work, so how actually connect those.
Resilience 2	Not sure how the tool would be used as ice-breaker Needs to give users more control	In terms of resilience, users having more control of the whole thing, as opposed of this template

Discussion

- Yea, I agree It kinda of undersestimates the creativity of the people who were in the space, but really issues with the bricks, because of (insocket), [Yea] It's not inside. And people have their own ideas, why the colour is purple. So I think you have to give more space, for people to think about the space. [Yea I agree]

Appendices

- We were discussing that there will be pieces, blocks, physical elements that would help to, figure out the spaces they have to stay in. And also changing the base of media, just paper. Specially they are involved with tools, so how to change it.
- Yes, we also talked about embodiment, so you embody the space, you need performers and this could be one step removed [Yea]

Customer Flow

Score	Improvement	Presentation transcription
Instructions 4.7	More flexibility in (1) personal understanding + (2) of how to use tool [rigidity can be reduced slightly and//or include extrar 'non' defined section\ Lack of solution suggestions by us (ran out of time)	Part of the critique was that I needed more flexibility on personal understanding of how the tool is used, or personal understanding of it, but specifically how this tool is used. For example, like some people feel like quite rigid, and like obviously the more people understand how to use the tool, and all the different aspects like the more you get out of this at the first place, sitting down at the end of task 3, I understand that if I'm working to figure task 1. Somehow we realised was after intuitive design had to be figured out, and therefore was intuitive despite the kind of graphic approach it has. Have a _____ and accessibility that was very important. We felt that like it could have been further for that reason, if you started you guys exactly how to use it, even the term consent that we weren't aware of, and where we invite for the start.
Design of material 3.2	Overall need for <ul style="list-style-type: none"> • Explanations to improve usability of tools (how, how long, who, why, etc.) • Suggestion for improve visual design of tools can/needs to be more specific (what/how) 	Now I will speak our second point for the task 2. That would makes you draw on explanations to improve the usability of tools, like specific things like how, how long, who, why, etc. None of them were on the explanation sheets, there is some examples, and then Something we realised for each of us that there was a common theme that emerged in the understanding of how each of these tools were to be used
Flexibility 3.1	<ul style="list-style-type: none"> • Understanding of all aspects of tool required to get most benefit out of it • Extended + Deeper levels of design exercise. E.g. Extending empathy • Possibly be *while of course x beneficial + needed_ • Require more optimal exercise for this level of engagement • 1-2 + stage of same exercise (?) 	in terms of extended applications, we've found out that instead of solve a one size fits all scenario, where we adopt this tool for this regional thing and this potential application. It could in some scenarios here like it could be more beneficial to have two probs for the same exercise, like we saw some very good suggestions here related to deeper levels of design and understanding, such as deep input, whereas possibly, categorise boxes in a preconceived template is a way to actually engage in that exercise. For that reason, that (inaudible) in two phases 1 – It's very similar to this, but for (2) the empathy aspect it could be something very very different. So not forcing you to one size fits one scenario, for something that is graphically intuitive but in practice.

Appendix I - Case Study 2: Completed proformas

Task 1 Proformas (1) Snapshot & Story, (2) Flow customer tools, (3) Storyboard contract

<p>Task 1 </p> <p>Can you review the instructions for facilitators? Highlight where you wish you could change it</p> <p><i>WE REALLY LIKE IT!</i> </p> <p><i>WE LIKE THE TOOL.</i></p>	<p>Improve it</p> <p>Can you give suggestions to improve the instructions?</p> <p>(1)</p> <p><i>NO IDEAS! WILL IMPROVE WHEN WE USE IT!</i></p>
<p>Task 1 </p> <p>Can you review the instructions for facilitators? highlight where you wish you could change it</p> <p><i>Flow Map to big too many boxes</i></p> <p><i>Need to focus on instructions</i></p>	<p>Improve it</p> <p>Can you give suggestions to improve the instructions?</p> <p>(2)</p> <p><i>Need time to read Pack first</i></p> <p><i>Do we need flow Map.</i></p>
<p>Task 1 </p> <p>Can you review the instructions for facilitators? Highlight where you wish you could change it</p> <p><i>Depends on the day. What experience was had e.g. positive/negative</i></p> <p><i>Quality of the facilitators engagement.</i></p> <p><i>Age group?</i></p>	<p>Improve it</p> <p>Can you give suggestions to improve the instructions?</p> <p>(3)</p> <ul style="list-style-type: none"> <i>Sad face → indicate what makes them feel sad</i> <ul style="list-style-type: none"> <i>help younger children understand.</i> <i>Happy face → indicate what works well in meeting.</i> <i>Different emoji charts for different age groups</i> <ul style="list-style-type: none"> <i>more suitable for older children. and different abilities.</i>

Task 2 Proformas (1) Snapshot & Story, (2) Flow customer tools, (3) Storyboard contract

Task 2 Can you explore the facilitation resources? Highlight where you wish you could change the tool

ACTIVE LIVES WOULD LIKE TO ENGAGE WITH INTRIGUE PEOPLE.

COULD WE USE ACTUAL PEOPLE AS FLOW CUMMINGS?

WOULD LIKE TO HAVE HAND THIS SOONER!

ADD PICS OF PREGNANT BODY

FLOW - ADD. Graps in Seeing

Task 2 Can you explore the facilitation resources? Highlight where you wish you could change the tool

Working at the top quite small - could be in some colour as prompts (red)

Lack of guidance on use.

Lited emojis

Task 2 Can you explore the facilitation resources? Highlight where you wish you could change the tool

Grab the interest of the Audience QUICKLY!

- Authors opinion!
- More pictures - less writing
- Needs to include All ages / Abilities / Gender
- Sexual orientation.

(1) Can you give suggestions to improve the tool?

Improve It Can you give suggestions to improve the tool?

Give the CYP (children + young people) some guidance on how to fill in the template.

Storyboard contract - words at the top too small - make bigger

need instruction to make sure you have a specific issue to focus on when you start process - in your meetings was the issue

could have some blank stickers to write their own emojis/symbols.

(2) Can you give suggestions to improve the tool?

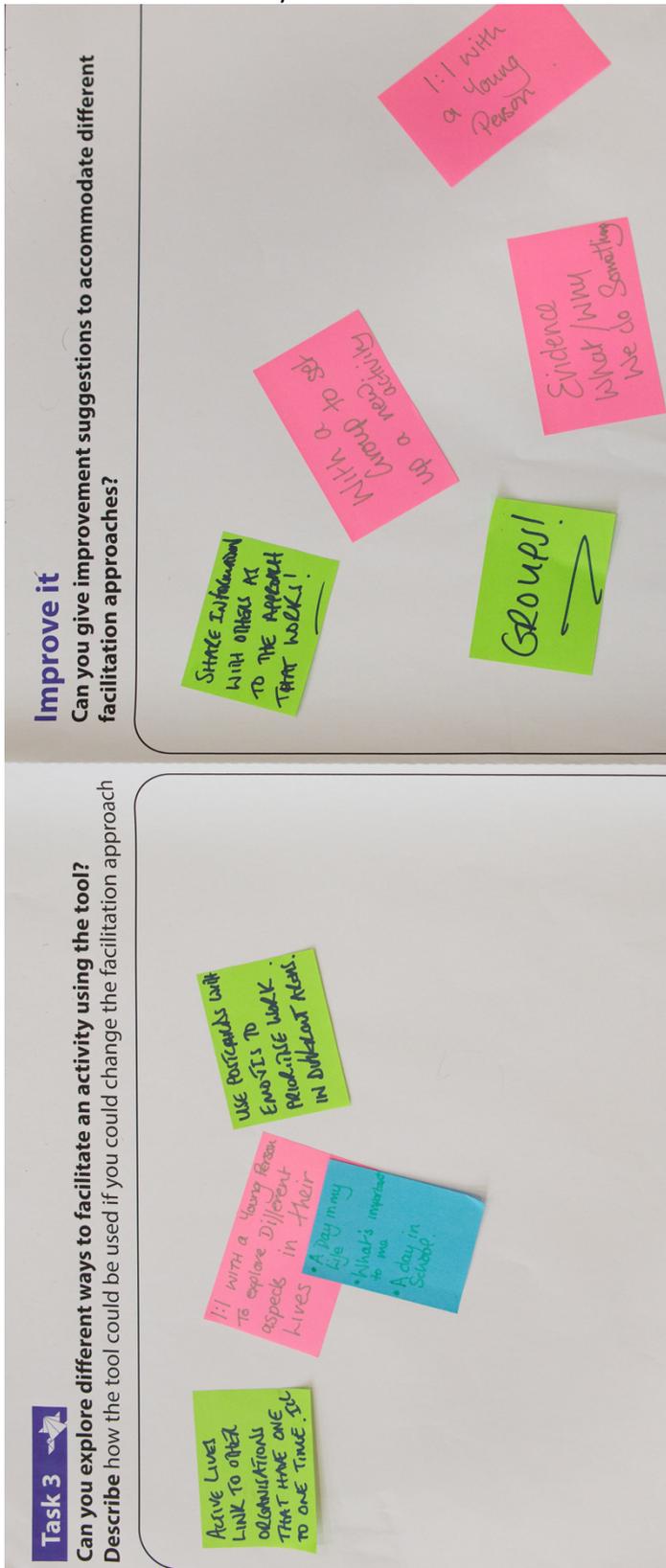
(3) Can you give suggestions to improve the tool?

- More pictures -> less writing.
- More Quotes.
- Teenage appropriate / younger person appropriate.
- Broken down - Bullet points - less wordy
- Bigger font.

Task 3 Proformas – (1) Snapshot & Story and (2) Flow

<p>Task 3 </p> <p>explore different ways to facilitate an activity using the tool? how the tool could be used if you could change the facilitation approach</p> <p>Can be used in meetings - Update on what's happening in services Staff can use to give feedback - link to CoC framework / KPI's link to data figures.</p> <p>Can be used to capture the information from individuals in a group Visual and quick Can then pull together Identifiers duplication. themes Ready to Present</p> <p>(1)</p>	<p>Improve it</p> <p>Can you give improvement suggestions to accommodate different facilitation approaches?</p> <p>Can be used to capture the information from individuals in a group Visual and quick Can then pull together Identifiers duplication. themes Ready to Present</p> <p>(1)</p>
<p>explore different ways to facilitate an activity using the tool? how the tool could be used if you could change the facilitation approach</p> <p>We could get all different reps from ICC to pick pictures of their customers put them on Flow map + look at what services they most access + where using the flow customer cards - we could then map the overlap to help look at also gaps in services.</p>	<p>Can you give improvement suggestions to accommodate different facilitation approaches?</p> <p>- Simplify Flow map so it is alot more generic. We would not need to use customer cards as we would get general overview from map, that was a visual aid for every one.</p> <p>(2)</p>

Task 3 Proformas – Storyboard contract



Evaluation sheets

<p>TOOL: Flow Cards/Map</p> <p>Evaluate the proposals Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 → Instructions for facilitators ☆☆☆☆☆</p> <ul style="list-style-type: none"> • Need to be clear to read instruction • Confusing on what process was. <p>Task 2 → Resources for facilitators ☆☆☆☆☆</p> <p>Liked but suggested additional features e.g. pregnant lady gap in service.</p> <p>Task 3 → Flexibility for facilitators ☆☆☆☆☆</p> <p>Use either one or other. Map or Card generally like process</p>	<p>TOOL: Snapshot + Story</p> <p>Evaluate the proposals Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 → Instructions for facilitators ☆☆☆☆☆ 5 ☆☆☆☆☆ SUM!</p> <p>we really liked it</p> <p>would like to use it + make changes</p> <p>Use it in our own organisations to feed into ICC's.</p> <p>Task 2 → Resources for facilitators ☆☆☆☆☆ 3</p> <p>Looked at it from a different perspective not being up appropriate / wordy!</p> <p>Task 3 → Flexibility for facilitators ☆☆☆☆☆ 5</p> <p>This has been seen in T-I how it can be used after an engagement/consultation Good resource.</p>	<p>TOOL: Storyboard</p> <p>Evaluate the proposals Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 → Instructions for facilitators ☆☆☆☆☆</p> <ul style="list-style-type: none"> • Good ideas to consider different Age groups - suitability for younger older children. <p>Task 2 → Resources for facilitators ☆☆☆☆☆</p> <ul style="list-style-type: none"> • Agree could have some further guidance / instructions • Needs larger font. • Great idea - blankish cards to encourage child to make their own emoji. <p>Task 3 → Flexibility for facilitators ☆☆☆☆☆</p> <p>Some really great ideas.</p> <ul style="list-style-type: none"> • A day in my life. • A day in school! <p>~ different ways to use emoji cards.</p>
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Appendix J - Case Study 2: Transcriptions of proformas and evaluation sheets

Task 1 – Instruction for facilitator

	Can you REVIEW the instructions for facilitators and highlight where you wish you could change it	Can you give suggestions to improve the instructions?
Snapshot & Story	<ul style="list-style-type: none"> We really like it 😊 We like the tool 	<p>No ideas!</p> <p>Will improve when we use it</p>
Customer flow tools	<p>Flow map to big too many boxes</p> <p>Need to focus on Instructions</p>	<p>Need time to read pack first</p> <p>Do we need flow map</p>
Storyboard contract	<ul style="list-style-type: none"> Depends on the day. What experience was had <ul style="list-style-type: none"> e.g. positive / negative Quality of the facilitator's engagement Age group? 	<ul style="list-style-type: none"> Sad face → indicate what makes them feel sad <ul style="list-style-type: none"> Help young children understand Happy face → indicate what works well in meeting Different emoji charts for age groups <ul style="list-style-type: none"> More suitable for older children and different abilities

Task 2 – Resources for facilitator

	Can you explore the facilitation resources? Highlight where you wish you could change the tool	Can you give suggestions to improve the tool?
Snapshot & Story	<ul style="list-style-type: none"> Grab the interest of the Audience quickly Author's opinion More picture – less writing Needs to include All ages / abilities / gender Sexual orientation 	<ul style="list-style-type: none"> More Pictures → Less writing More quotes Teenage appropriate / younger person appropriate Broken down – Bullet points – less wordy <ul style="list-style-type: none"> Bigger font
Customer flow tools	<p>Active lives would like to engage with inactive people</p> <p>Could we use actual people as flow customer cards?</p>	<p>Would like to have had this sooner</p> <p>Add pics of pregnant lady</p> <p>Flow = “add Gaps in Service”</p>

Storyboard contract	<p>Wording at the top quite small – could be in same colour as prompts (red)</p> <p>Lack of guidance on use</p> <p>Liked emojis</p>	<p>Give the CYP (children + young people) some guidance on how to fill in template</p> <p>Storyboard contract – words at the top too small – make bigger</p> <p>Need instruction to make sure you have a specific issue to focus on when you start the process – in eg start meetings was the issue</p> <p>Could have some blank stickers to write their own emojis / symbols</p>
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Task 3 – Flexibility for facilitator

	Can you explore different ways to facilitate an activity using the tool? Describe how the tool could if you could change the facilitation approach	Can you give suggestions to accommodate different facilitation approaches?
Snapshot & Story	<ul style="list-style-type: none"> Each area present update on Snapshot Bring to meeting and complete quickly on day to present at ICC <p>Can be used in meetings – Update on What’s happening in services Staff can use to give feedback – link to CQC framework / KPI’s link to data figures</p>	<ul style="list-style-type: none"> Can be used to capture the information from individuals in a group visual and quick Can then pull together identify duplication themes Ready to present
Customer flow tools	<p>We could get all different reps from ICC to pick pictures of their customers put them on Flow map + look at what services they most access + where using the flow customer cards – we could then map the overlap + help look at also gap in services</p>	<p>- Simplify Flow map so it is a lot more generic</p> <p>We would not need to use customer cards as we could get general overview from map, that was a visual aid for every one</p>
Storyboard contract	<p>Active lives</p> <p>Link to other organisations that have one to one time ICC</p> <p>1:1 with a Young Person to explore Different aspects in their Lives</p> <ul style="list-style-type: none"> A day in my life What’s important to me A day in School <p>Use postcards with emojis to prioritise work in different areas</p>	<p>Share information with others as to the approach that works</p> <p>Groups!</p> <p>With a group to set a new activity</p> <p>Evidence what / why we do something</p> <p>1:1 with a Young Person</p>

RE-EVALUATION: TRANSCRIPTION PER TOOL/Presentation

Snapshot & Story

Score	Improvement	Presentation transcription
<p>Instruction for facilitators</p> <p>5</p>	<p>We really like it</p> <p>Would like to use it & make changes</p>	<p>Evaluating the project</p> <p>We really liked it, we think is something that we like to use it to make changes because we don’t necessarily doing it at the moment. We could use it on our own organisations and also use it within the ICCs to sort of measure the</p>

Appendices

	Use it in our own organisations to feed into ICC's	engagement process we are doing, and the impact that is having, so this snapshot will be good to be in ICC's meetings to say: we are not doing something because we like doing it, we are doing it because we were asked to do it by the people who supposed to be engaging with. We gave 5 stars for the instructions for the facilitators
Resources for facilitators 3	Looked at it from a different perspective Not being YP appropriate / Wordy	When we got task 2, they looked at it differently that it wasn't YP friendly, that it was not you know, work. So they looked at a different perspective that we did. So we felt that, if it was going to be used 1-to-1 young person it's not the purpose. So, we gave just 3 stars didn't we, that it wasn't YP appropriate, it was very wordy. So ways to improve it could be bullet points, photos and things like that.
Flexibility for facilitators 5	This has been seen like T1 How it can be used after an engagement/consultation Good resource	It was again quite looking at our perspective that you've done a consultation with a group of YP or adults or whatever found a gap in service, you come up with a project, and this is a good way to presenting that evidence to things like your managers to ICCs to say look this is what we wanna do, give us a hand doing it, or this is what we wanna do, we want money to do it or whatever. It was interesting how different groups saw it differently.

Discussion

- I like that
- That is probably one of my favourites.
- I think you are right actually.
- I like it because we can print it to our champions meeting, and (unaudible) then we just scribble on that thing, and put it and take away, and take it to the ICC meetings.
- I would probably see it more as practitioners tool rather than YP tool

Storyboard contract

Score	Improvement	Presentation transcription
Instruction for facilitators 3	<ul style="list-style-type: none"> • Good ideas to consider different age groups – suitability for younger / older children 	I thought we did some good ideas to consider different age groups, and it was suitable for some young and older children, but I think the emojis will probably need a couple of re-digging a little bit.
Resources for facilitators 3	<ul style="list-style-type: none"> • Agree could have some further guidance / instructions • Needs larger font • Great idea – Blank stickers to encourage child to make their own emoji 	I definitely agree, I think it need some larger font, and some further guidance, and instructions. But I really like the idea of blank stickers to encourage the child to make their own emoji.
Flexibility for facilitators 4	<p>Some really great ideas</p> <ul style="list-style-type: none"> • A day in my life • A day in school - Different ways to use emoji cards 	I saw some good ideas about kind of re-digging it for like a day in my life, a day in school, and some different ways to use the emoji cards.

Discussion

- I like that for engaging with YP in a 1 to 1 or even in a group, (Yea, Yea). I really like that, and I would like that my staff to use with YP to get, you know like. If a child is struggling with attending school, you can say: right, let's do this activity, what a day is like for you (yea yea), and they could really unpick that (yea yea), and I think the fact there emojis and also now, you said blank ones, which is a good idea, because it might be, turn around and say that you know. I'm getting picked on (unaudible), I can't do maths because ... it's a way of them talking in a safe environment about it, so I really like it to engage with YP. But you could also use it with a group of YP say: we've got this group, what do you wanna do for the next 6 weeks? And come up with a storyboard plan, they might like to do CSC (...), healthy eating one week, do cooking sessions.

- I don't know if this is relevant, but it got me thinking about how much time we have to spend engaging with young people, I think the postcard with emojis is potentially good but how we can show them we are actually listening to them, so they are filling a card telling something they feel about something, but do we show to them we are listening to them.

- You do you mean getting them to feedback once they've done it (dissonance), and it's take away that tone

- I was in an event in Carnforth on Saturday, I started to engage with young people about activities and stuff, how do I get that trust that I'm gonna listen to them, and done something like that.

- There is a Leapfrog tool called You Said We Did, and we could also see if there is a children version of that template feeding back to them using it. We use that, we've done quite a lot.

- There is an improved version from a workshop, where it's You Said We Did, and it's different because there is a feedback: what do you think. We did this for you, and do you think about it. So it's really a continuous improvement

- It's taking it to another step, isn't it really. That tool is not originally said in process, that is another one isn't it, you feed back and say what happened to you.

- Could be really a good selling thing to engage with young people, if you have poster that say: That's what last time we did (dissonance)

- Just with that...

- I thought it could be use it like the children nurse goes to content, she speaks with YPerson and she could get something like that get the child something like that to do, and then you could take it back with your business case, she is trying get more with a survey, so you can say: actually this is the YPerson is going through the service what is like for her (yea yea), what she would like to see changing...

- It's really good creating this social.

- I remember a discussion with a facilitator that fed back into with one day in a school: what happen before school...

- Specially, child and young carers something like that

- That's what I said that would be really good with young carers

Flow Customer tools

Score	Improvement	Presentation transcription
Instruction for facilitators 2	Need to be clear to read instruction Confusing on what process was	We just found it quite confusing, (we didn't know) what the process was, what to do first, and how to use both different tools (...). So that was rated 2.
Resources for facilitators 3	Liked but suggested additional features e.g pregnant lady gap in service	Rated. They liked it. The resources but they suggested some additional features, so like a pregnant lady, also (...) gaps in services, so just more additions. But they like the resources,
Flexibility for facilitators 3	Use either one or other. Map or card generally like process	Suggested you could use either one or the other, either the map or the actual flow cards to make it easy and more generic.

- I found it a bit confusing, I didn't like it, no.
- Yea, confusing

- I really like, and I thought that could be a good tool, if we (...) and got in meetings and think about all the different service users we work with, what age groups they are, we will come up with like a grid with our services and groups, and with that we could look at what our gaps are, and also, when we got together to our champions meetings, so go through with that, we can go with this, this is what we do and also stop, you know we can look at what you are doing is duplicated, you know, but also we could get gaps, it could be health or an area we are not doing, or it could be, you know a YP groups we are working with. So, identifying that gap and you could come up with ideas, and how you can move, you could tap into this to move, because people got bodies, we just don't have money.

- Exactly, yes. I think we thought we could use it in the ICC, you know just make the map, what you got in the locality.

- I agree with X, I think it's pretty confusing, but I think is the beginning of a bigger earlier work, you know. Once you start mapping, it's mapping tool. You know, it a big motivating step, that is how you are making difference to people, (yea), because you are getting this hectic of these specific groups.

- Yea, we all work with neighbour teams and, in my process there might be a disparity between those areas, because we used to make assumptions about community needs that, and they don't need that, cos they are more self-sufficient and a bit more economically viable or whatever really is but look at what really the gaps are

- I like the bit I like about you are saying about this idea of mother and child at integrated health community get together, these connectors is all, we are all doing connecting work, connecting these things together, we are all know what we are doing, so that would make it clear what is connecting bits are

- Duplications, gaps

- People who want to... you know... more and more stories notified... you know, the healthiest inside of thing. It's about services isn't it? But, the healthies don't even know the groups I am working with... you know these things like that because having that bigger picture, and then, something like that to be shared, and people know we are doing this or doing this.

- I think people do, some people do want to know everything, but you can't hold everything, can you? There are something more I need when I'm having conversation like that, what is happening, what did you say something like that, some group Cumbria university about it and x, you know you can't each know like that, someone needs to know about that opportunity referring others, all these kind of things like that, something like that would be good. But we good, but

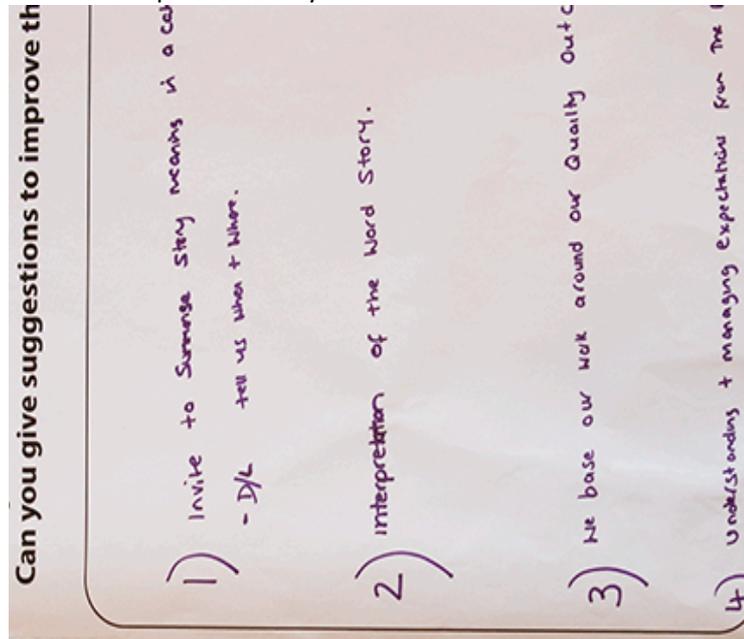
- we read the instruction and were bit confusing. It would be good as well, because we are working with this children champion, we are all going to feeding back to everybody's services, quite like X nurse that I don't know in, you know it would be better you know, you see me at work and he drop me out of nursery, but we probably don't know about services we want, so it would be good for us all, I think this would be a good start to do.

- Back to our teams,

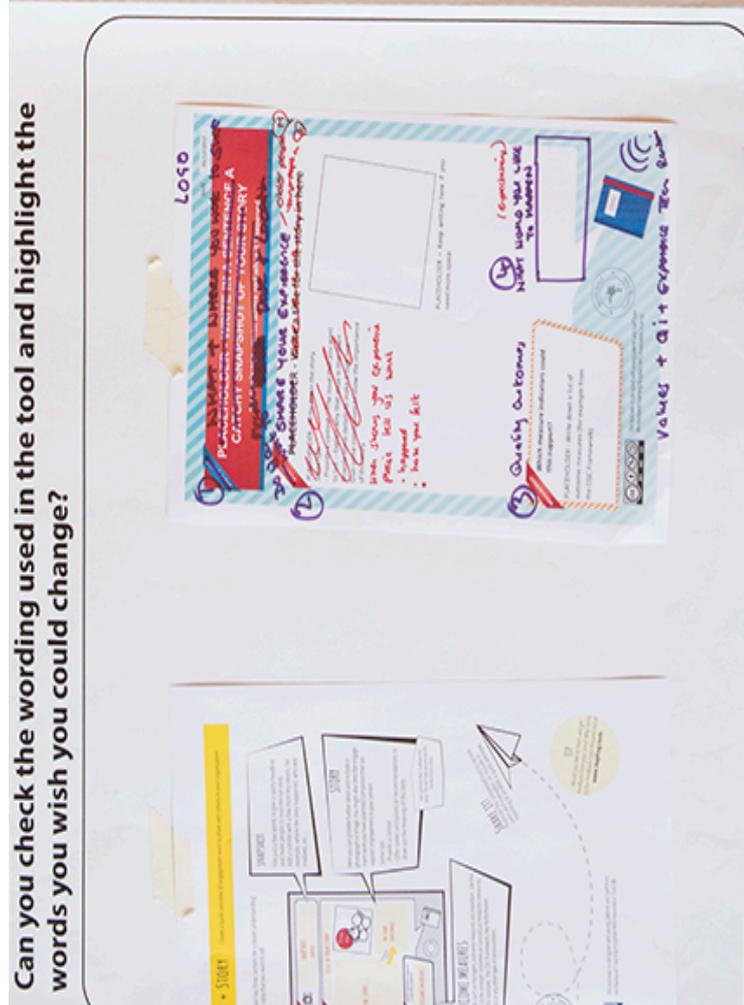
Appendix K - Case Study 3: Completed proformas

Task 1 - Snapchat & Story

Can you check the wording used in the tool and highlight the words you wish you could change?



Can you give suggestions to improve the



Task 1 – Small Things

Can you check the wording used in the tool and highlight the words you wish you could change?

Can you give suggestions to improve the tool?

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Idea to use at the beginning of an event/project

as part of setting the scene of getting everyone's ideas/questions/

give feedback & use as part of plan/meeting agenda.

Supports being open & transparent.

5: Beginning of the meeting - give an idea - help/ask for clarification

Scatter/lightbulb moments - in the meeting

acknowledging that everyone has a voice, is valued + can be involved.

Simple language + plan +

Task 1 – Feedback cycle request

Can you check the wording used in the tool and highlight the words you wish you could change?

Can you give suggestions?

The image shows two worksheets with feedback forms and several sticky notes. The top worksheet is a 'Feedback Cycle Request' form with sections for 'What is the story?', 'What does this story mean for you?', and 'What have you / will you do with this story?'. It includes a 'PLACHECKER' section for identifying feedback and a 'Per some-lired Words' sticky note. The bottom worksheet is a 'Task 1' form with a flowchart and sections for 'STEP 1', 'STEP 2', and 'STEP 3'. It includes a 'PLACHECKER' section and several sticky notes: '1. Feedback is fine wrong wording for young people', 'Grammar i.e. young people speak', 'Process does not flow', and 'To busy'. The sticky notes are yellow and contain handwritten text.

1. Feedback is fine wrong wording for young people

Grammar i.e. young people speak

Process does not flow

To busy

Per some-lired Words

Be spoke to our needs

more use of emojis i.e. visual. 😊

Task 1 – You Said We did

Can you check the wording used in the tool and highlight the words you wish you could change?

LEAPRO

You Said... *Just because its said doesn't mean its done.*

We did: *it allows us to continue to improve. i.e. we might not get it right the first time.*

AND: *is for us to get feedback on what we tried.*

Can you give suggestions to improve the tool?

You Said... *suggested...*

We did: *we had pizza on tues menu*

AND: *the pizza is rubbish once a week. we want it twice a week.*

Leapfro

You Said, We Did

Tool Guide:

The You Said, We Did tool is simple way for a central provider to make smaller units have their own voice. It is a simple tool that can be used in a number of ways. It can be used to collect feedback from staff, students or parents. It can be used to collect feedback from a range of stakeholders. It can be used to collect feedback from a range of stakeholders. It can be used to collect feedback from a range of stakeholders.

Other descriptions for this tool are: 'You Said' or 'All in Together' (provided above in the 'You Said' tool). It is a simple tool that can be used in a number of ways. It can be used to collect feedback from staff, students or parents. It can be used to collect feedback from a range of stakeholders. It can be used to collect feedback from a range of stakeholders.

The You Said, We Did is an interactive evaluation tool developed by the Oregon School of Air and Health Sciences across the high schools of Astoria.

Task 1 – Role Bingo

Can you check the wording used in the tool and highlight the words you wish you could change?

Can you give suggestions to improve the tool?

'Role BINGO' → Project Activity Sheet (more formal description for our organisation/team)

'Event' → Project (sounds more general - could be a task or an event)
(too specific)

'Team sheet' → Team Tasks (more specific)

'Bingo' sounds like a game - not appropriate for our needs, not serious enough

'team' doesn't clarify function (eg. work sheet)

Task 2 - Snapchat & Story

Can you use the tool and explore the design of material? Highlight where you wish you could change it

PLACEHOLDER - WRITE IN A SENTENCE A CATCHY SNAPSHOT OF YOUR STORY
PLACEHOLDER - Write where and when it happened

PLACEHOLDER - Write a title for the story in here
Some tips:
- Keep it short - This is how you'll appear to all - Explain why that issue is important to you
- Provide some details to make it look real - Use illustrations to show the importance of this story

PLACEHOLDER - Keep writing here if you need more space

CHANGE TO EXPECTED OUTCOMES

Can you give suggestions to improve the tool?

DIAMOND PERSON (MENTOR)

TITLE

STATUS

SV MESSAGE RE DIAMOND M.

MENTOR'S MESSAGES

VOLUNTEER INVOLVED WITH D.M.

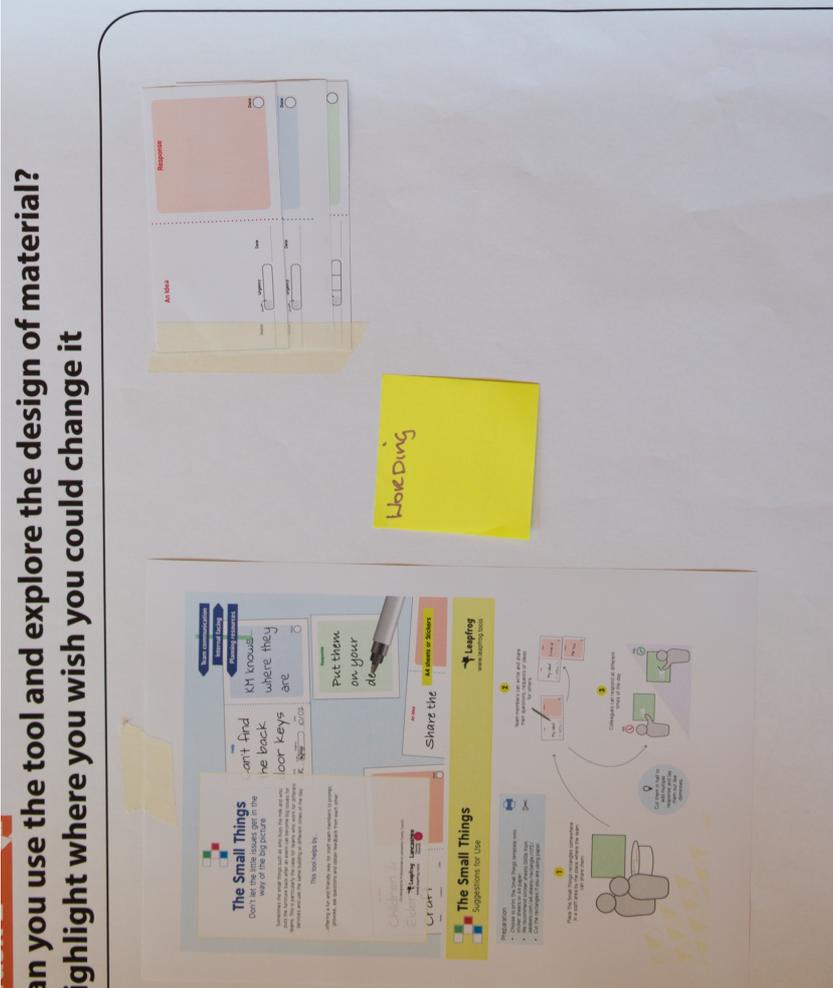
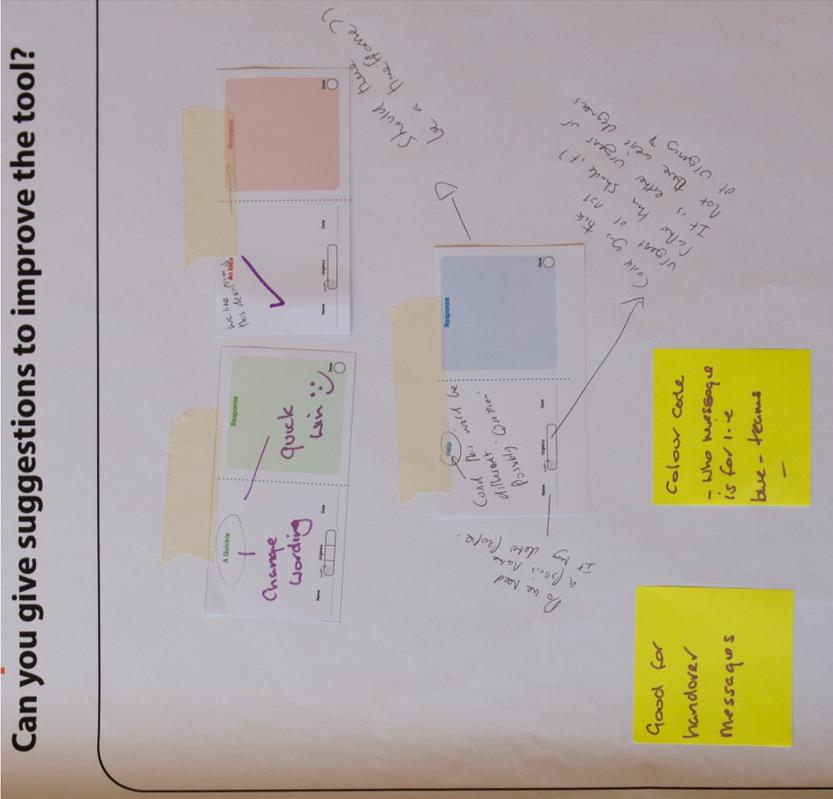
SPREAD D.M. THROUGHOUT THE SYSTEM (CONTRIBUTOR)

more EYE CATCHING LANGUAGE HUMOUR REAL PERSONABLE CAPTIONS DYNAMIC

DIAMOND PERSON (MENTOR)

DIAMOND PERSON (MENTOR)

Task 2 – Small Things



Task 2 – Feedback cycle request

**Can you use the tool and explore the design of material?
Highlight where you wish you could change it**

Can you give suggestions to improve the tool?

- Black text on the orange.
- make the instructions bigger - better use of the space.
- could use for debrief / reflection / supervision.

Task 2 – You Said We did

Task 2

Can you use the tool and explore the design of material? Highlight where you wish you could change it

"Please provide your feedback here"

~~You Said...~~ ? not appropriate for us

You Said...

We did:

You Said, We Did

Speech bubble (more emotive shape - more conversational) instead of square (too angular)

~~You Said...~~ not applicable

Tool Guide:

The 'You Said We Did' tool is a simple way for service users to provide feedback on their experience of the service. It is designed to be used by service users who are unable to provide feedback in other ways. The tool is designed to be used by service users who are unable to provide feedback in other ways. The tool is designed to be used by service users who are unable to provide feedback in other ways.

Once developed the tool can be printed out in A4 or A3 for larger posters. It can be used for individual or group use. It can be used for individual or group use. It can be used for individual or group use.

Once developed the tool can be printed out in A4 or A3 for larger posters. It can be used for individual or group use. It can be used for individual or group use.

Once developed the tool can be printed out in A4 or A3 for larger posters. It can be used for individual or group use. It can be used for individual or group use.

Can you give suggestions to improve the tool?

Shape of box - too angular.

A speech bubble implies we're willing to have a conversation = more people-oriented, more personal/friendly.

① Could the ~~tool~~ tool be given to service users to provide their feedback at the outset, + returned to them later, once we have resolved/dealt with their query

② As explained in tool guide ← (ie. we summarize the feedback/query, and tell service user what we've done about it)

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Tool guide

2 different users:

Task 3 - Snapchat & Story

Adapt it

Can you give suggestions to improve t

← Paper Copies - Hand Copies
 ← Could it be used in Video format?
 ← Could it be double feed into a board game?
 → Cue Cards
 → Team Building tool.
 → Speed dating-type exercise
 → Gift Speeches.

Task 3

Can you use the tool in a way it was not intended to be used ?

SNAPCHAT + STORY - Create a rich experience of engagement with 15, 10 or 5 photos or video sequences. This way that you want to tell.

3 PARTS - You can use these words to create understanding. This way that you want to tell.

SNAPCHAT - You can use these words to create understanding. This way that you want to tell.

STORY - You can use these words to create understanding. This way that you want to tell.

OUTCOME MEASURES - You can use these words to create understanding. This way that you want to tell.

PLACEHOLDER - WRITE IN A SENTENCE A CATCHY SNAPSHOT OF YOUR STORY
 PLACEHOLDER - Write where and when it happened

PLACEHOLDER - Write down the story
 Provide a context - The issue that you want to tell. Explain why it is important. Give some conclusions to show the importance of this story.

PLACEHOLDER - Keep writing here if you need more space

Write support indicators code this support!
 PLACEHOLDER - Write down a list of outcome measures (for example from the CCE Framework)

Task 3 - Small Things

Can you use the tool in a way it was not intended to be used ?

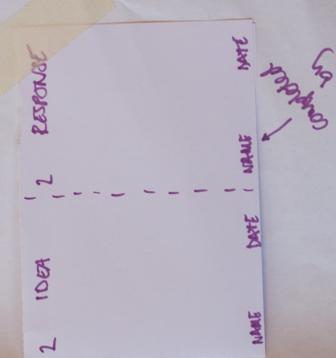


① Agenda setting tool.
Action setting tool.

Numbered
Ab size
Add name + date
on second half

Can you give suggestions to improve the tool?

Have blank yellow 'Response' cards for extra info!



RESPONSE

2 IDEA 2 RESPONSE

NAME DATE INITIALS DATE

via contextually

Task 3 – Feedback cycle request

Can you use the tool in a way it was not intended to be used ?

Write on background paper ok from back-ground?

LEFT
LIST OF TASKS
Meeting agenda
Register (the reg)

RIGHT
WHO / Deadlines etc.
Minutes of Meeting
employees Sign in/out

Can you give suggestions to improve the tool?

All existing text would need to be changed.

STAFF REGISTER	DATE	IN	OUT

Task 3 – You said We did

Can you use the tool in a way it was not intended to be used ?

DATE: (Trust Logo) **3 SERVICE AREA**

You Said, We Did

1. WE ASKED:

1. You Said: **We did**

Agents' Menu

▶▶▶ Set your goals and keep track of your progress

You Said, We Did

Tool Guide:

The You Said, We Did is a simple way for a service provider to make visible what users have said for their service and what the provider has done in response to their comments. It can be used by an individual service user to show how things have changed in response to their comments, or put up on a notice board, to show to a whole group how a service is responding to their feedback and input.

Once downloaded the tool can be printed out in A4 for use as a notice board. It can be used to record and share any feedback, requests or ideas users have had about a service or activity. Then users can share what they have said and what the provider has done in response to their comments. After a set period of time, complete the tool and share it with the service user. The tool can then be used to show progress and what has been done in response to what users have said. The tool can then be put up on display again to show an entire group.

The You Said, We Did is a simple way for service users to engage with people about their feelings about a service and then transparently show what has been done.

It was developed by the Health Improvement Research Group at the University of Aberdeen and is now being used by care professionals who work with adults with learning difficulties across the Highlands of Scotland.

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Can you give suggestions to improve the tool?

1. Change words To Allow tool to be used in a different way (Not all feedback needs actions, however its important to capture + share feedback)
2. Additional box to share any difference a learning
3. SERVICE AREA SPECIFIC
4. DATE SPECIFIC (REDUCE WORKING ON OLD DATA)

Task 3 – Role Bingo

Can you give suggestions to improve the tool?

Leapfrog

MEETING TRAINING ICEBREAKER
MEETING TRAINING ICEBREAKER

MEMORY CHART - DEMENTIA WARS

MEMORY GAME - ACTURES

ICEBREAKER

QUESTION	QUESTION	QUESTION	QUESTION
PHOTO OF MORGAN			
WHO IS THIS? QUESTION		QUESTION	QUESTION

MEMORY GAME

OLD RADIO	OLD TV	COBBLED STREETS	RED PHONE BOX
OLD PHONE	OLD FOOD ANGLIA		

MINI ICEBREAKER

WAD AM I - WHAT IS THE LIE!	
A TRUTH	A TRUTH
A LIE	A TRUTH

Can you use the tool in a way it was not intended to be used?

Role Bingo

Notes:

1	2
3	4

Role Bingo

Notes:

1. Choose up to 10 questions from the list below to use in your bingo.

2. Write the questions in the boxes on your bingo card.

3. Ask your partner to ask you the questions.

4. Mark off the questions as you answer them.

5. The first person to get a full row or column is the winner.

Evaluation sheets

Can you discuss how useful is each set of proposals?
Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!

Task 1 → Words

★★★★★

We think the suggestions still stand. Language is more open & honest - use 'suggested' + 'tried' like the additional box for feedback. Allows to go back to the start.

Task 2 → Design of material

★★★★★

Speech bubble shape definitively change 'you said' we did. include one additional box. with just AND...? so what?

Task 3 → Flexibility

★★★★★

Limited flexibility - only meaning. Communication tool. - reports / sharing

TOOL: You said, we did.

Can you discuss how useful is each set of proposals?
Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!

Task 1 → Words

★★★★★

(Role Bingo tool)
Inappropriate words ~~for~~ (for our organisation) ~~is~~ identified + changed to meet our specific requirements

Task 2 → Design of material

★★★★★

(Role Bingo tool)
- Limited scope to change existing tool
- Changed as far as possible

Task 3 → Flexibility

★★★★★

- Multi-purpose tool (Role Bingo tool)
- adaptable to many situations
- Simple + effective
- Clear function

TOOL: ROLE BINGO

→ Move this to the TOP

<p>Can you discuss how useful is each set of proposals?</p> <p>Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 → Words</p> <p>★★★★★</p>	<p>Can you discuss how useful is each set of proposals?</p> <p>Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 → Words</p> <p>★★★★★</p>	<p>Can you discuss how useful is each set of proposals?</p> <p>Rate each set of proposals using stars out of 5, and share a few words that express your thoughts and feelings further. Thank you!</p> <p>Task 1 → Words</p> <p>☆☆☆☆☆</p>
<p>Task 2 → Design of material</p> <p>★★★★★</p> <p>Suggestions too 'busy' Restricted use of tool Full of boxes - over-riched information.</p>	<p>Task 2 → Design of material</p> <p>★★★★★</p> <p>WHAT, WHY, WHEN, HOW, WHO, TOOL SUPPORTS THIS, CAN BE USED FOR VARIOUS DIFFERENT PURPOSES - PROJECT PLANNING, MEETING PLANNING, TASKS/DELIVERY, EVERYONE INVOLVED BURNT, ALL THE PROCESS. LANGUAGE, TRANSPARENTLY, QUICKIE → ? Idea ✓ help → Question.</p>	<p>Task 2 → Design of material</p> <p>☆☆☆☆☆</p> <p>Language needs adapting Less words more visual</p>
<p>Task 3 → Flexibility</p> <p>★★★★★</p> <p>Like use of in different formats Explore electronic video use, to being more alive. - Incore podcast Good use of life speech</p>	<p>Task 3 → Flexibility</p> <p>★★★★★</p> <p>MORE DYNAMIC SUPPORTS MIND MAPPING. 'URGENCY' SECTION NOT NEEDED - USE FOR 'IDEAS' RATHER THAN TASKS.</p>	<p>Task 3 → Flexibility</p> <p>☆☆☆☆☆</p> <p>Use the words to give better + visual indicator (1/5)</p>
<p>Task 3 → Flexibility</p> <p>☆☆☆☆☆</p> <p>TOOL: SNAP SHOT + STORY</p>	<p>Task 3 → Flexibility</p> <p>☆☆☆☆☆</p> <p>SUPPORTS THE ROLE BINGO + INDIVIDUAL BINGO.</p>	<p>Task 3 → Flexibility</p> <p>☆☆☆☆☆</p> <p>Discipline can be put in the use other 'kind of' element - better it was presented + more it's better it's being because a question... because the person cannot focus.</p>
<p>TOOL: FEEDBACK CYCLE (REQUEST)</p>		

Appendix L - Case Study 3: Transcriptions of proformas and evaluation sheets

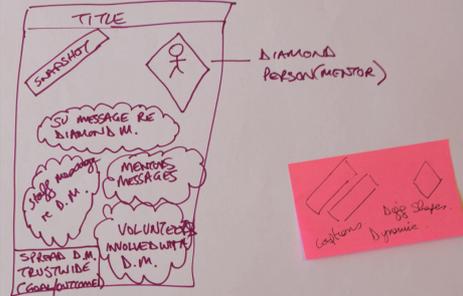
STAGE 1 – Words

	Can you review the wording used in the tool, and highlight the words you wish you could change?	Can you give suggestions to improve the tool?
Snapshot & Story	<ol style="list-style-type: none"> 1. Title: What + Where you want to share Date + Location 2. Do you want to share your experience = Older people (M) young people (D) When sharing your experience please tell us <ul style="list-style-type: none"> - What happened - How you felt 3. (Expectations) What would you like to happen 4. Quality outcomes <p>Values + Ai + Experience team....</p>	<ul style="list-style-type: none"> - Invite to summarise story means in a catchy headline D/L tell us when + where - Interpretation of the word story - We base our work around our Quality outcomes - Understanding + managing expectations from the persons sharing their experience
The small things	<ul style="list-style-type: none"> - Sudden thought, eureka moment! - Light bulb moment 	<ul style="list-style-type: none"> - Idea to use at the beginning of an event / project / planning / meeting as a part of 'setting the scene' a getting everyone's ideas / questions - ... to collect + map + give feedback + use as part of plan / meeting agenda - Language plain + simple - Supports being open and transparent - Acknowledging that everyone has a value + can be involved - - Eg. Beginning of an event/meeting - Pile of an idea help / a question - - In the meeting - Scatter – quickie / light bulb moment squares
Feedback Cycle	<p>Feedback is the wrong wording for young people</p> <p>Grammar. E.g. young person speak</p> <p>Process does not flow</p> <p>Too busy</p> <p>Personalised words</p>	<ul style="list-style-type: none"> - More use of emojis. i.e. visual - Bespoke our needs

Appendices

We say we did	<p>Just because its said doesn't mean its done</p> <p>It allows us to continue to improve ie we might not get it right the first time</p> <p>The AND: is for us to get feedback on what we tried</p>	<ul style="list-style-type: none"> - You said suggested... - We had pizza on the menu - We did tried - And: The pizza is rubbish - We want twice a week.
Role Bingo	<p>'Bingo' sounds like a game – not appropriate for our needs, not serious enough</p> <p>'Team' doesn't clarify function (eg work sheet)</p>	<ul style="list-style-type: none"> - 'Role bingo' → Project activity sheet (More formal description for our organisation/team) - 'Event → Project (Sounds more general → could be a task or event (too specific) - 'Team sheet' → Team Tasks (more specific)

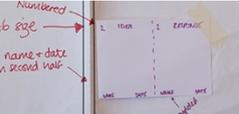
STAGE 2 – Design of material

	Can you use the tool in a way it was not intended to be used?	Can you give suggestions to improve the tool?
Snapshot & Story	<ol style="list-style-type: none"> 1. Change to expected outcomes 	 <ul style="list-style-type: none"> - More eye catching - Language - Humour - Real - Personable - Captions 1. Dynamic
The small things	<ul style="list-style-type: none"> • Wording 	<ul style="list-style-type: none"> • Change wording → Quick win ☺ • (An idea) We like this description • Do we need a ____ name? It may dete people • (Help) Could this word be different? Possibly 'question' • Should here be a timeframe? • Could you tick urgent or not? Rather than shade it? It is either urgent or not there aren't degrees of urgency <p>Good for handover messages</p> <p>Colour code</p> <ul style="list-style-type: none"> - Who message is for for i.e. blue - teams
Feedback Cycle Request	<ul style="list-style-type: none"> - This should exactly look like 	<ul style="list-style-type: none"> • Black text on the orange • Make the instructions bigger – better use of space • Could use for debrief / reflection / supervision

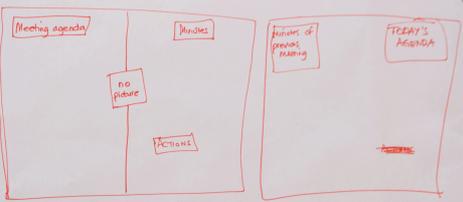
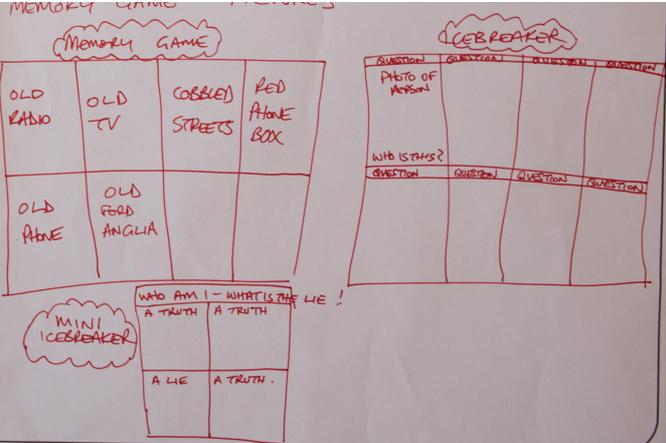
A FRAMEWORK FOR IMPROVING KNOWLEDGE EXCHANGE TOOLS

We say we did	<ul style="list-style-type: none"> • “Please provide feedback here” • Not appropriate for us • Speech bubble instead of square (too angular) • (more emotive shape – more conversational) 	<p>Shape of box – too angular</p> <p>A speech bubble implies we’re willing to have a conversation</p> <ul style="list-style-type: none"> • = more people-oriented, more personal/friendly <p>Tool guide: 2 different uses</p> <ul style="list-style-type: none"> - Could the tool be given to service users to provide their feedback <u>at the outset</u>, + returned to them <u>later</u>, once we have resolved/dealt with their query - As explained in tool guide • (I.e. We summarise the feedback/query, and tell service user what we’ve done about it)
Role Bingo	<p>Suggestions</p> <ul style="list-style-type: none"> • Use electronically, ie if unable to attend meetings • Introduce comments/challenges 	<ol style="list-style-type: none"> 1. The title made it seemed like a game 2. Include task in each box 3. Ability to use/electronically ie. As people may not be able to attend meetings 4. Introduce a title on individual sheet 5. Remove notes + Include comments + challenges

STAGE 3 – Flexibility

	Can you review the wording used in the tool, and highlight the words you wish you could change?	Can you give suggestions to improve the tool?
Snapshot & Story	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> - Paper copies – Hard copies - Could it be used in video format? - Could it be developed into a board game? - Cue cards - Team building tools - Lift speech
The small things	<p>1 – Agenda setting tool</p> <p>Action setting tool</p>	<ul style="list-style-type: none"> - Have blank yellow ‘Response’ cards for extra info - Make it bigger - A6 Size - Add name + date on second half 

Appendices

Feedback Cycle Request	White on orange background is hard to read	 <p>All existing text would need to be changed</p> 								
	<table border="1"> <tr> <th>Left</th> <th>Right</th> </tr> <tr> <td>List of team tasks</td> <td>Who / deadlines etc.</td> </tr> <tr> <td>Meeting agenda</td> <td>Minutes of agenda</td> </tr> <tr> <td>Register (Fire regs)</td> <td>Employees sign in/out</td> </tr> </table>		Left	Right	List of team tasks	Who / deadlines etc.	Meeting agenda	Minutes of agenda	Register (Fire regs)	Employees sign in/out
	Left		Right							
	List of team tasks		Who / deadlines etc.							
Meeting agenda	Minutes of agenda									
Register (Fire regs)	Employees sign in/out									
We say we did	<p>1 – We asked, You said 2 – What’s new? 3 – Service area Date:</p>	<ol style="list-style-type: none"> 1. Change Words to allow tool to be used in a different way (Not all feedback needs actions, however it’s important to capture + share feedback) 2. Additional box to share any difference in learning 3. Service area specific 4. Date specific (Reducing working in old data) 								
Role Bingo		<p>Meeting / Training icebreaker -- Memory chart – Dementia ward Memory game – Pictures</p> 								

Snapshot and story

Task 1: 5 stars

- We looked at the words, and for our organisation, changing the words makes more user friendly and understandable for a wider audience. So some of the suggestions on the title was “what + where you want to share” rather than placeholder, and also inserting a date and a location, so you can pin point to a particular location and the relevance regarding the day.
- When we talked about the words around story, we said share your experience rather than placeholder because ‘story’ can be like ‘made up’ and not true

- We also felt that it would be really good to put around or related to the organisation outcome, so having a box in the bottom, rather than saying indicators or measures it would be quality outcomes. So that it could be capture whether be (winst) to call the outcomes for our organisation.
- We also thought about an additional box of words, what would you like to happen. So, this would be closing the learning loop, and it would be added a dimension about what they want to happen and also managing their expectation, because often people give the feedback and they just to wanna get off the chest, they don't actually wants anything doing with, so people always try to make changes or change something where naturally the individual just wants to share their experience.

Task 2: 1 stars

- This is around the design of material, and the suggestions that we got, we are giving 1 star because we found that changing all the things they suggested, make far too busy, and they made it task specific, so it was restricting the use of the tool, it wasn't adaptable in our area, because they changed to a particular thing, and it is full of little boxes, which actually restrict the information, being able to put in it. Whereas, the original, the actual one give more space to put stuff in

Task 3: 3 stars

Around flexibility

- We like the use of different formats, some of the suggestions were around exploring electronic video use, being that more alive. So actually an electronic template still write the story, and rather than picture podcast or video, and it would make more inclusive and real.
- We like the ideas around a lift speech, so to focusing on rather than being war and peace, that would actually focus on that what you are actually putting in in.
- In addition to that about the format, and having, perhaps, that's we've been commenting about of having our team on the bottom, so they would know it comes from quality team, improvement and experience team,
- and perhaps a rainbow or a team designing a badge to ensure that's comes from a quality team, it might be just a rainbow, so people would know that is about quality improvement (TASK 1)

NO DISCUSSION

The Small Things

Task 1: 5 stars

- Changing the wording we have here.
- We decided it might be an idea to use it at the beginning of event or project, pre progress mapping, so we could actually plan out right from the beginning, getting everybody's ideas, and questions.
- Give feedback and use as part of a plan or meeting agenda as well
- We looked at the what, when, how, who tools supporting this as well
- It can be used in many different purposes, beginning of an event or a meeting scatter things like we are moving on the other one on the quickie things around as well
- Keep the language plain and simple, I acknowledge in that everyone has a voice and it's valued and everybody needs to be involved. So they can obviously inputting in various sections of the plans equals forward.

Task 2: 3 stars

- We thought it could be more dynamic
- Supporting mind mapping, again fitting to the rest of the other tools around that we can utilise
- We found that the urgency section was not needed, use it more for ideas rather than tasks, but otherwise it was quite useful. It was mentioned about colour coding, that's okay if it's a small team, but if it's a big team. People forget what colour code they are. It would be better to put initials on it something like that.
- It also says on here that it's good for handover messages, yes it is. It's good for that.

Task 3: 4 stars (Presentation)

- It's actually a agenda setting tool, the suggestions were to make it bigger, maybe A6 size, which is half of the size of the A5 for anybody who is not 'tarkist'
- Add a name and date on the second half it says, and have a blank yellow response card for any other information people can add in. We felt that it was a good idea as well. As long as it doesn't get too busy on the thing you are feeding back on. We said it supports the role bingo and individual bingo as well. If fits in that we giving that 4 stars.

Comments

- And that can be used on tips on teams, just as a quick

Feedback cycle request

Task 1: Wording: 3 stars

- The area we work which is children and young people, some of the wording perhaps it's a bit technical and jargonistic, so we questioned if some of these could be changed, and some of the grammar. We felt like it was quite, to the words to make it person friendly
- And it also to make more use of emojis, and visual, this obviously appealing particularly to young people,
- It's bit wordy, a few words would be better.
- About the wording, we read that as a three (stars), even though we are the people commenting on

Task 2: Design of the material: 4 stars

- We thought the suggestion that the tool that it has been used should represent the one on the description of the feedback, we thought that was an excellent suggestion. We thought it was really good suggestions, because I think there could be a potential confusion in there, and again we were thinking about this could be used rather than digitally as a paper copy and paper format
- The other really good suggestions were make the instructions bigger, and better use of the space, we thought it was really a good idea,
- And that it could be used as debriefing/reflection/supervision
- We also suggested that it could be used as tip-offs as well

Task 3: Flexibility: 2 stars

- Some of the feedback was that there should be no picture, we disagree with it. We felt like that having a picture or an image would be really helpful in terms of getting, making it more personal, making it more sense to the individual

- Perhaps If people were concerned about picture being with confidentiality, they could perhaps, like we said an image or an emoji or anything really. Something to brought life more visually
- and we wrote that feedback as a tool

Comments

- We had a conversation about the picture, aren't we? We concluded that it was really important, if it's somebody's story than this (that) story of the person, or the environment they are talking about or whatever it helps.
- We were changing the use of that, and depending on, we were using it as signing register, so like that
- But changing the tool that you are going to use it for story, into something that it's gonna become like a governance type of thing for that team, it doesn't seem right. Because that's story building showing that person story, whereas it was about changing the tool wasn't it (it to use the tool in the way it wasn't intended to)
- We were thinking of the use of it, an addition of a box, the values or trust values

We said we did

Task 1: 5 stars

- We did the first bit and our work is actually 5 star, we think the language, the words on it are not helpful. I know our trust we use we said and we did from friends and family, but we looked at it say things you suggested because you saying 'you said we did' implies everyone someone says something, we are going to do something different, it also implies when someone say something we completely understand what they are trying to say, and we interpreted, and the way we interpreted, we must be right. So, we changed the wording to 'You suggested and we tried'', because that really fits into quality improvement tackle. So an example we came up with, a piece of feedback I remember, young people want pizza on the menu, so we suggested we have pizza on the menu, and we tried having pizza once a week, but we felt like, we actually we don't know that it necessarily meet their needs, because they might want pizza on Friday, but actually they want pizza on Saturday. So we want another box on the bottom that said, and so what? So could be: the pizza is rubbish, so we might start again, pizza is rubbish so we try a different brand. So this is continuous quality improvement cycle, which is much more helpful. So this is about the wording.
- We have 2 out of 5 for that.

15:34

Task 2: 3 stars

- We really like some of the suggestions, that came back around having speech bubbles, so if we say on the screen is like a sharp edged bubble, and the suggestions was to have a rounded speech bubbles because it's softer, and implies a conversation could go on that cycle, keep us talking with people. So we gave it three, for the design. It's really simple, and straightforward and we quite like that, we could build more on that.

16:10

Task 3: 2 stars

- Because it has limited flexibility, the suggestions were still about being feedback related. There was a suggestion about all suggestion needs actions, and I get what X

saying about some people want to tell what they think, but even though they want to know we've done something, if all we have to do is listen, and never understand and try to improve, than we probably have missed the point of why they want to sort tools. So, which is why we still (...) we want a box in the end: has that work, has that improved things? If they came back with that experience bit saying.

- We also thought it was worth keeping this cycles because lots of people we work with will come in our services, we hope, so if we got a group of YP they said they want pizza and next time, and someone says "oh can we have pizza every night?" if we already have that, "PDa" say we could use that as starting point, and say we've been through this process before, do we need to tweak it for this group of people, or is there any other enough learning in here to get to a decision without having to do ou 'Pedia' says samples or ever again.

Comments 17:42

- P1: I like the suggestions about your suggestion, I think it's good description. But, I'm not so sure about "we tried" because it suggests something that we tried to do it (unaudible).
 - o P2 Yes, I get that
- P1: I like the idea of changing the terminology, and you are right, because your rationale is really good.
- P3: I guess on its own, it looks a bit like that, but if we try to get pizza once a week than
- P4: It's something that you said, it's about closing some of that conversation, isn't it. So, what was your experience? So what did you think? So it's asking about the next question, about the feedback
- P5: It always make it half, saying I've never told this before, you said sounds like a bit more accusative
- Many people agreeing: Yes, you said, and you did (giggles)
- P6: I do like the suggestion there, because when you stick it on the board and you said, your suggestion, you suggested (unaudible), rather than you said
- P7: That particular tool, we can use it in a lot of particular ways, and I liked that we tried it, we spoke about saying you asked, you told us, sometimes when you get some feedback, not necessarily needs changing but actually you just reporting back on what people say on service
- P8: See, I haven't struggle with that, reporting back to whom for what purpose
- P9: I think if you ask people to take time to actually complete questions, you then tell them what everybody say about your service, they know what they put on question there, but I think it's important to feedback to it to anybody who haven't completed the survey, coming to see what people said about the service.
- P10: So for an example, there is a recent questionnaire in X team, brings up around communication and we don't need anything changing about, we love that thing about, that thing about communication. So it actually spoke to the roles, on board in the service area to say "We asked you how effective X service routine was around communication, and you said: wonderful this, that, so a group of people see what people said about that, yea we have got what makes difference on the bottom, so we put that box around "what's new", so we are actually what is new is we continue to communicate in an effective way
- P11: What I would see there is an opportunity right what is bloody good about mind mat service, and the rest of the trust, so what, the action is the mind mat team seems to be getting something like here, do we have an area who is struggling with communication.

- P12: We do the service in other teams, but I think it's important to people to talk, to give feedback that you actually, share that not only with other teams and services, but share it with other people, and people that is coming in to the service as well.
- P13: I think you have done that, you walk into our service and see it, what you said and actually you share, or questions,
- P14: or your comments in it
- P15: what do we do? If someone come and we leave that, and we said we did is wonderful, you know what, you know my experience, I was a bit worried about saying, my experience wasn't like that. Because you are saying my team is wonderful and communicate really well, but my experience of that wasn't as good as what you are saying up there. I think we just need to be careful out what we are doing that, and well, not everybodies don't share any fact, ant that's right we do share some, but it's maybe how we word it, to go back to the public to say.

Role Bingo

- The general consensus is 'bingo', it's a bit too gammy. Sounds like a game here

Task 1:

- The first change is the name of 'Role Bingo'
- We like the idea of a simple management project tool. It's basically about allocating tasks, and give deadlines to individuals. project management activity sheet, it just like project

Task 2 was about the design of material

- Again title seems like a game
- Then include tasks in each box
- So tasks are clearly documented
- Suggestion of using it electronically
- Include comments + challenges section

Task 3 – 4 stars quite adaptable tool

- Meeting training icebreaker
- Memory game, basically in the tasks boxes you put things like old radio, television, red phone boxes. Things to prompt people's memories
 - o P2 – It's also to use in a dementia ward to clarify why an old telephone box. You missed that out
- It is quite versatile, (...) to achieve that form.

Comments

- P1 - Role bingo is kind of a team to-do list.
- You make a team to do list is that actual job to do. But a bit of Role bingo, it just brings a bit a smile to a day, because I'm still on a work, I will do what I suppose to be doing.
- I see where you come from that two of the team who worked on these both said about sounds like a game. I think that the bingo is not the big fact, I think you think about the audience that you are sharing with it, because we go with that to a senior management team, like Im are going to role bingo now. It is to do with, maybe It might do good, they might enjoy it, it might shake them all.
 - o P2 – It probably do (26:36)
- It's a bit like tailor to your audience, I think this is gonna be conversations around, it's not just I'm gonna, it's not making that environment and everyone on board of it,

Appendices

- P3 – Do you think there is a room for use for a simple project management tool. Because it's not overcomplicated
- (P1) no , it's not overcomplicated. But you could make it complicate if you make into a simple project management tool
 - o P4 - Yes I agree
 - o P3 - Yea

Overall comments,

- they are all excellent tools. From the workshop we've done today, it shows adaptable you can use them, with ideals for people on their own field, and how you could adapt it.
- I think for me, we have conversations with the digital process, but some of the services we provide or support will not allow that to happen within those services is insecure environment. What I did like about these morning and the tools is the activities we did and how you presented it, and the format you presented it this morning. I think we said we will take it for us, for the event we are doing, and I really liked that. It was great!

Research is behind [open]

Dimensions Layers	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
DESIGN	Challenge / Briefing	Models of interaction	(Build) Resilience
FACILITATION	Facilitator notes	Resources produced for facilitator	(Encourage) Facilitator response
APPLICATION	Example or Use notes	Design of material	(Enable) contrary activity

DESIGN

WILL CHANGE THE INSTRUCTIONS

ES FOCUS ON NEW VERSIONS

SPECIFIC TOOLS

FUNCTION

IMPROVING THE CONCEPT, adding features

PROFESSIONAL

SPECIALISE

GROUPS WITH FEW SAME ROLES

OR FOLLOW UP REGULATIONS

LOOK AT VISUAL DESIGN

NEED TO LOOK AT TOOLS FROM A SPECIFIC CONTENT

BUT DON'T NEED TO HAVE SAME BACKGROUND OR BE PART OF SAME TEAM

HOW TO VALIDATE THIS?

CAPACITATION

FLEXIBILITY IS PART OF EDUCATION PROGRAMME

FACILITATION

KEY

CAN TRANSFORM TOOLS INTO TOOLS FOR GROUPS

BUT ROBERT ENJOY, IMPROVEMENTS ON INSTRUCTIONS

ENGAGEMENT/ENLIGHTENMENT

IMPROVING INSTRUCTIONS FOR FACILITATORS

LOOK AT GROUP DYNAMICS

MORE EXAMPLES, SHARED APPROACHES

AGE APPROPRIATE, AUDIENCE

PROFESSIONAL

INSTRUCTION

FOCUS ON FACILITATION

APPLICATION

IMPROVING PARTICIPANTS ENGAGEMENT WITH TOOLS

IMPROVED CLARITY AND WORDING / LANGUAGE

VISUAL DESIGN

ADD FLEXIBILITY (RESILIENCE)

ENABLE CONTRARY ACTIVITY

INSTRUCTION & FACILITATION FOR PARTICIPANTS

FOCUS ON USE

TOOLKIT, NEW RESOURCES, FEATURES

APPLICATION

LOOK AT VISUAL DESIGN

NEED TO LOOK AT TOOLS FROM A SPECIFIC CONTENT

BUT DON'T NEED TO HAVE SAME BACKGROUND OR BE PART OF SAME TEAM

HOW TO VALIDATE THIS?

CAPACITATION

FLEXIBILITY IS PART OF EDUCATION PROGRAMME

Appendix N - Participant Information Sheet – Case study review

Leapfrog Participant Information

Improvement Matrix: Prompting New Ways of Thinking about Knowledge Exchange



Introduction

We would like to invite you to take part in a research study, which is part of a larger research project called Leapfrog: Transforming Public Sector Engagement by Design.

Leapfrog is a three-year research project. We want to develop new ways to help people contribute to local public services and facilities. We want to test how well these new approaches work, in a series of research projects.

This sheet provides information on what research we are conducting and how you would be involved. We invite you to read this carefully before deciding if you would like to participate. We will also go through the information with you verbally. If you have any questions, please let us know.

What is Improvement Matrix?

In this short project, we are working with engagement practitioners and academics to explore the usefulness of a collaborative and creative framework for improving knowledge exchange tools called Improvement Matrix, in order to develop engagement practices.

In this research project, we plan to present the Improvement Matrix with instructions to you and see how you creatively respond to it at a specific time at your convenience.

What does the project involve?

- We would like to invite you to take part in an interactive activity that consists in talking through the Improvement Matrix individually or in a group, where you will be stimulated to reflect on your own practice.
- We will creatively capture data to be studied on video/ audio recordings and on handouts, such as written observations.

What are the Benefits of Taking Part?

- You will be able to become part of a network of people interested in knowledge exchange, collaboration and creative engagement practices.
- You will receive the resources that come out of the process.

Thank you for reading this information sheet, please sign the consent sheet to take part.

More info at www.leapfrog.tools

If you have any concerns or complaints about this project you can contact **Judith Mottram**, Director of the Lancaster Institute for the Contemporary Arts, LICA Building, Lancaster University, Bailrigg, Lancaster, LA1 4YW
E Mail: judith.mottram@lancaster.ac.uk • Telephone: 01524 594395

This study has been reviewed and approved by the Faculty of Arts and Social Sciences and Lancaster Management School's Research Ethics Committee.

What do we collect and share?

This activity forms part of the research for the Leapfrog project. While you participate in this research, we will write field notes and capture photographs, video, audio (via dictaphone) and written responses. Given the data capture methods of this study, efforts to anonymise your contribution will be made at the point of recording as we will be recording group discussions and feedback, but non-identifiability is not a guarantee.

Videos and photographs may be taken of you taking part and presenting in workshops and you may be identifiable, unless you ask us not to before the workshop.

The information/audio/video/images we collect may be used in documentation published for academic, educational or promotional purposes. This will include future reports, articles, and presentations relating to the Leapfrog project, and web-based publishing, which can be viewed by the general public. We will only publish your name or quotes (e.g. on our website or in our academic articles) with your permission.

Information about you will be stored securely for at least 10 years and only project researchers will have access to it. We will only publish photos that reveal your identity with your agreement. We will only use your contact details to get in touch with you for project purposes and you can be asked to be removed from our mailing lists at any time. We will not share your information without your consent.

Do I have to take part?

No, your participation is entirely voluntary.

You may limit your participation, withdraw at any time for any reason, or ensure we do not use any photos, film or audio, which identifies you. To withdraw, please contact us up to two weeks after your participation and we will do our best to remove any information (whenever possible) that identifies you from our records; but after this point the data, which identifies you, will remain in the project.

To limit your participation or withdraw, contact the PhD Researcher **Rosendy Fernandez Galabo** either by phone 07961 033464 or by email r.j.galabo@lancaster.ac.uk or the Leapfrog Principle Investigator, **Leon Cruickshank** by email, telephone or post. Email: l.cruickshank@lancaster.ac.uk. Address: LICA Building, Lancaster



Appendix O - Consent form – Case study review

Leapfrog Consent Form

Improvement Matrix: Prompting New Ways of Thinking about Knowledge Exchange



Please tick as appropriate

I confirm that I understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	<input type="checkbox"/>
I understand that my participation is voluntary and that I am free to withdraw up to two weeks after I have participated in the study without giving any reason.	<input type="checkbox"/>
I give my permission for the Leapfrog team to photograph/video and audio record me, while participating in this research for the Leapfrog project.	<input type="checkbox"/>
I understand that any such photos/videotape/audio or other digital recording will be the property of the Leapfrog research group, which is a pan-university project funded by the AHRC Connected Communities project.	<input type="checkbox"/>
I understand that any information given by me may be used in future reports, articles or presentations by the researchers for academic, educational or promotional purposes, including publication to the Leapfrog website, and my personal information will not be included. Efforts to anonymize my contributions will be made throughout field work, but non-identifiability is not a guarantee.	<input type="checkbox"/>
I understand that my name will not appear in any reports, articles or presentations without additional consent being sought.	<input type="checkbox"/>
I understand that data will be kept according to University guidelines for a minimum of 10 years after the end of the study.	<input type="checkbox"/>
I agree to take part in the Improvement Matrix project.	<input type="checkbox"/>

Participant Name: Signature:

Date:

Name of researcher: Rosendy Fernandez Galabo Signature:

Date:

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

One copy of this form will be given to the participant and the original kept in the files of the researcher at Lancaster University



Appendix P - Case study review responses

This presentation repeats to all five case study reviews

My background

I have a bachelor's in industrial design and master's in multimedia design. So my education background is basically in designing physical and digital artefacts with focus on the outcome. After these degrees, I worked in a non-for-profit organisation for a year where I started to facilitate creative workshops to secondary technical school pupils and instructors and got interested in creative engagement.

So, I came to the UK to pursue this interest and started a PhD looking at ways to improve the practice of 'let's say' delivering workshops and making 'things', such as tools for knowledge exchange, which is what we are going to discuss today.

For this discussion, I define tools for knowledge exchange as adaptable resources that help people to have creative conversations in order to achieve a desired objective. This could be building a community or building an awareness about an issue, or to better understand individuals in a community or organization.

As any building tool, tools can be used in many different ways such as a spanner: install sink, assemble a chair, fix a washing machine

What gives meaning to the tool are the people that are involved in the process, the context and the purpose in which the tool is being used for

Although there are many tools and toolkits available in the literature and online, I don't believe in a one-tool-fits-all. Each design situation is so unique that it requires specialised tools to have more fruitful and creative conversations. So, that's the reason came up with a framework to improve existing tools.

Any QUESTION?

Research project presentation

So, when people design and deliver workshops, they often use tools to support their practices. I've identified three roles and activities involved in this process.

Designers create tools and a space, where people can exchange knowledge, where they have to consider the purpose, the context and the people involved in the process of working together to meet an agreed objective.

Facilitators use tools to enable people to have creative conversations, making sure that everyone can contribute to the activity, and engage them to achieve a desired outcome.

Participants use tools to express creatively their experiences, feelings, and ideas with others to contribute to the project, programme or policy that affect their lives. So, the application is the practical use of the tool

So based on a literature review, my experience and background in designing tools, I identified three dimensions that could lead to improvement of tools for collaboration.

As I said before people and their intentions define the meaning of the tool, so in their practice which corresponds to a layer of engagement, the improvement of these three dimensions were looked at in different ways.

Instruction – It is the information that guides people how to use and apply a tool in an engagement situation. This is about how to use a tool to achieve your purpose (e.g. how can a tool engage participants to plan something, or what needs to be done to enable participants share their feelings, what the tool is asking participants to do)

Function - which is related to the tool intentions and its purpose. It is what a tool is used for (e.g. a tool for planning, collecting information, sharing outcomes, for expressing feelings)

Flexibility – It is the capacity of a tool to change according to the situation (e.g. how to make a tool more flexible to different ways of planning, or how a tool can adapt to different facilitation approaches, how participants can creatively express their thoughts and feelings in different ways)

The first two are about what a tool is like NOW, and the third is what can it do beyond that.

So, putting together these practices and dimensions into a matrix and hinting at ways of improving tools, I came up with these 9 distinct categories that could be used to improve tools.

PARTICIPANT 1

Could you tell us a bit about yourself, and the work that you do?

I'm in my first year of my PhD at the school of architecture in the Royal College of Art. Originally, I come from an Industrial Design background, I studied at the Catholic University of Rio, Puc-Rio, then I moved to São Paulo, where I did my masters at the Faculty of Architecture and Urbanism of the University of São Paulo. I did my masters in design, although the school pretty much architecture, and my studies there, my investigations there, are a bit in design and architecture, because I'm working with one organisation from the largest complex of favelas named Complexo da Maré, that started in the 40s and grew very rapidly, and is one of the largest favelas in Latin America. There are around 140,000 residents living there it's a huge community, actually it is a city. And My work departed from, it's a long long trajectory I will try to be brief, but my master's what I wanted to understand is that why designers were so dissent from the Rio city, from who are already transforming who are trying to forge better quality of life for people in the city, so my investigation started by observing the spaces and how organisations work in there, and they transformed the quality of the urban space. At the same time I wanted to understand the relationship between the organisation and the residents in terms of engagement how people would respond to this organisation because this organisation literally replaced the role of the state of the major

and the governors because they are the ones who provided education programmes and (...) especially public security because we were dealing with a very complicated set of favelas which they have three criminal armed groups taking care and controlling the territory, so it's quite complicated.

From what I've observed from my research during my masters is that I had the chance to do, not only observing how the demographic work but also to run a few workshops with them to understand what kind of methodologies could work and I've tried, kind of mixed them and used a bit of design thinking, a bit of human-centred design, participatory design, and also in the midst of everything I used a bit of design anthropology because the relationship with anthropology was huge for me because I needed to get my own autonomy in that territory and walk by myself, talk to people, being a woman changed everything obviously because if you think about it, if you are a men and this territories they don't view you as an enemy, but if you are a woman you are not that kind of suspicious so it was an interesting experience for me.

At the beginning I couldn't walk by myself, so at the end I could even cycle and do everything by myself, and it was a huge experience in terms, even for my whole life I think. So this experiences in terms of participatory design, this workshops, they were very nice because in the end, they were very simple, there were things like developing furniture for one cultural centre or exploring activities of dialogues, they were pretty simple. They were interesting because in terms of realisation of achieving a result, people were very accomplished, and they were happy with the result but the process of doing design was a nightmare for me. I had to do everything by myself, all the responsibility was all in my back, and there were moments that I was trying to get materials from side of the Maré and would receive a call like "Bruna don't come here, there is a fire shooting happening, stay there, and then I was, Wow okay" and then this kind of situations permeate that territory and it's not that you can avoid that this modules of design do not capture that kind of reality, and that was the main outcome of my master.

Now in my PhD what I'm researching is that if this process of doing participatory design (cut) this module you kinda use, if you don't look at certain kind of issues of coloniality, racism, the experience women live in that place, if you don't look at this other entanglements, you will never be able to fully work with the people, that's the first thing, and the second is that I decided to avoid this modules a little bit, and tried to look through education because what came to my mind is that the people there they don't really need designers to run their organisation or architects, or there are a bunch of knowledge from these areas that could certainly leverage their work. So I think that for me I'm trying to pursue a way that forge forms of emancipation towards this kind of knowledge and exchange tools of knowledge in design, because I don't expect them to become designers of course, they will never be. But in a certain way they are. It's not like we can't acknowledge that I think.

Interviewer – It's quite interesting what you said because now I kind of common understanding on what you say and what I can say. So I kind of can calibrate my question or my conversation with you. Our thoughts are aligned about providing people that, it's not that they are not designers, it's like you said. They are also experts in what they do through design. It's basically just the concept of design. If you see design as I kind of skill that you can acquire or something that you do in a daily basis, that is what design is basically.

What interested you in the framework you experienced/learnt/seen at the EAD conference?

What interested me in the workshop was that my current research, what I'm intended to do now is to look at different forms of participation that in view autonomy somehow, that is promoting autonomy and emancipation of knowledge and this kind of ideas. When I saw your proposal, I saw that this guy is kind thinking in the same strand of me not sure, I would like to see that, and see what he is talking about. And when Rosana came and stayed in my place a few days after the conference, she showed the matrix and saw that he has a very in-depth thoughts about this, and then I really want to hear more, and understand his line of pattern / practice, because I'm trying to do a taxonomical investigation of different forms of practice, I'm looking at Latin America but also Europe to understand how practices are promoting autonomy somehow, I'm still finding my way.

Sorry for taking your time, but actually this is quite helpful for me at this stage of my research.

This quite useful to me because I'm trying to discuss in the realm of urban space in my case, my interests are in urban, and what is interesting in this organisation I'm working with. They talk about urban space from the perspective of education, of race, of gender, of culture, art even the problems of the place. But they never talk through the perspective of urban studies, but of course they are not urbanists. So it's interesting because I wanna go through that directions, what kind of tools could leverage their understanding in urban knowledge for example, people are not aware that favelas are actually a product of urban planning, but favelas are. If you think the way the city was structured, you see, yea that's very helpful to understand because, although it's a **bit generic it can also lead to different context.**

My background and presentation

- I would like to draw on your experience in tools or collaborative practice/research, and ask you a few questions

1. How relevant is the research a just presented you?

I guess because I honestly, I'm going to very open and honest, I don't wanna go back there, I still work with them, with the group, with the organisation. I'm the main graphic designer, even though I'm in London right now, I'm constantly doing several projects of graphic design for them.

I know that by the time I will be there, every time I'm there they also put me to do something or give a class here about graphic design or do a workshop of furniture of a place, or let's do this or let's do that. So it's about knowledge exchange in the end.

And sometimes I'm still looking for an appropriate, what kind of tools could co-developed with them, rather than I'm saying what they have to do or I'm saying what, like I'm not from the favela you know? So I want them to look at the tool, and say okay: this is useful to us, this improve our work, or it enhance our capacities. That's more or less what I'm looking, so yes it relates to my practice because in terms of, especially the part of instructions, functions and flexibility. Because in my own work, so far, I have separated to two areas, which are methods and content. So what kind of content should be co-developed in terms of tools, and method would be how to articulate these methods with people. But you divided into three forms, which is another perspective for me to understand the instruction function and

flexibility. Which I found very interesting because I haven't thought about of this notion of flexibility of improving the tool while you are doing your practice. I think that's very useful.

2. Does this research make you think about things in a new and different way?

It does offer me new perspectives because it's interesting to see that I'm actually dealing with huge crisis with design right now. Because sometimes I feel like oh my god what I'm doing, design is not useful, especially at this moment in terms of political problems in Brazil. But anyway, I think they are very useful to see that design could still be embedded in structures and also work with people without neglecting so much of its background. Sometimes I feel like design needs to change everything, and I think this shows me that it's not really true because we can still rely on the background we have, in terms of methodologies and tools. We can use those, we don't have to demonise them, which I do sometimes. So I think it's good to see that people who are working in design are trying their best to make the discipline more flexible and more attentive to the kinds of reality that another group, social groups.

One thing that it's still in my mind it's a doubt, it's the part of the facilitation. Because from my previous experience, (communication problems) facilitation is the only thing that I still have doubts in my mind, I still question. Because from my previous experience I've noticed that I've been a facilitator. I've always been an actor working with people, they relied on me as the expert as this specialist, even though I put myself in a posture that I am just conducting the experience. So I think for me, maybe it's not the facilitation itself but the idea that everyone is with their minds on the same page, we are all here together, doing knowledge exchange and tools exchange and I think that sometimes within the context your dealing with, that mindset is not necessarily, I don't know how to achieve that, you know? Because they don't really see in the same position as I do, so people in Maré for example, they would see the work as, we are learning how to do woodwork or we are learning how to assemble a new piece of furniture but they would never see as okay we are trying to make a diagnosis of this cultural space and who are the people who use this space, and you know? So facilitation for me was a bit tricky, because I couldn't see myself as a facilitator, but more as a specialists in the end. That would be my only question about the matrix. But other than that it offers me new perspectives, especially the part of wording or interaction models, I know you are using multimedia, which would not be quite my area, but gives me good lights to perceive my area. I think

3. To what extent is this framework useful for what you do?

I would have to use first, I'm going to my field work in September, perhaps I could give it a try, we can do another conversation and you can help me to structure, and could totally test it there. That would be a great opportunity.

4. How might you apply this framework?

First of all, there are a few principles or assumptions that I follow in my work, which are if this framework is not being used for the purpose of the organisation I'm working with, so it's useless, this is the first thing. So I would have to apply in a space or to talk about an issue or discuss a topic, it doesn't matter the kind of tool I'm doing, it needs to attend their needs and goals because I'm literally following one of the objectives of the organisation, which is break with stereotypes and promote new, this is the object they have and decided to incorporate it into my work, I decided to follow that objective as one of the objectives I'm trying to pursue within my work, which is break with stereotypes and promote new narratives and imaginaries in the context that is constantly defined in the right of the city. So, they are always talking about the right of the city, always talking about new narratives, about new imaginaries, breaking stereotypes because there are a lot of stereotypes regarding favelas, and the frontiers between communities there.

So, I'm trying to understand which kind of urban knowledge would be useful to enhance this discussion they already have, and they explore their objective in some many ways, in so many layers, in several activities. So my intention now is to go, and observe these activities, and talk to the coordinators of each programme inside of the organisation, and see where I could try experiments, and that would be the place I could try and experiment the framework, after observing and understanding local demands, and what they already doing, their challenges, and so on, you know? That would be the core.

I would give one example I could try, so let me think. So, they have, for example, one of their goals is they want to change the entrance of all of the buildings in mare, they have, the organisation has there. So, there are around eight buildings, and the area in front of this buildings they are usually, full of waste, they are not taken care by the state, they are neglected, so what kind of tools could reconfigure this space of the street in front of these buildings, and what kind of tools they would like to use to transform these spaces? would be transform these spaces into spaces of dialogues where people could meet? or would these spaces be more green with more trees, and places where people could do gardening for example? So it's a different approach, because I'm looking in the urban sphere, but I would try to use the dimensions as you said, probably, bringing a few tools that I have from my side, and trying to bring their tools as well, and promote first a conversation about. I think that would be my, intuitively how it would work. And after doing that, we could start coordinating the tools and then finding the best pack, so that's how I would probably.

5. Which limitations do you anticipate this framework might have, if you apply this framework in what you do?

The application I would probably think about it. When you are talking about multimedia or interaction design or graphic design, the mediation is way less when you talk about, actually transforming the urban space somehow. So, there are limitations about resources, when you are talking about the area of mare. For example, they do a lot of resources or materials they could use, the abandoned materials we have there it's amazing, but on the other hand they don't have enough money, they are very limited, (...) they are always applying for these fundings, so they can run their projects, so definitely resources would be a problem, you know? We could speak and talk more abstractedly that would work, but if you don't have the practice, people putting their hands on, I don't think they would actually exchanging knowledge, so the practical work in my case, it seems quite important, seems very relevant to make the process relevant for them, so we talk about resources.

Interviewer – I think now that you highlighted this. Because it's kind of contextual. Here I have loads of resources, and you translate, if you transfer this location here in the UK, and bring it to another region which they don't have the resources I have here. Well, that is quite interesting.

You have always to think that I'm working with the margins of the margins, so I'm not working only with the periphery of the planet, but I'm also working with periphery of the periphery.

But that doesn't invalidate the framework at all, it's just there is a few adaption, it's a matter of adapting and transforming it a little bit, making it more flexible maybe, the versatility as you wrote here.

6. What further developments would you suggest me to improve the framework?

I think I don't know how you are tackling this or dealing with this. But, I would say that many times, I think that designers are not ready to work with the public realm. I think designers are ready to propose, they are ready to facilitate, they have their smile in their faces. But they are not ready to deal with complex situations like there is a fire shooting on the other

side of the streets, stay there. This kind of thing, I know it's extreme, I'm talking about an extreme case, but in your case would be, how do you become more prepared to deal with someone, that would be working with a person with autism, for example or person who has disability. I think there are psychological, and perhaps anthropological aspects in our profession that in our education that should change, and I don't know how this would fit in your framework, but this kind of preparation I think it should be encompassed somehow. I don't know how you are thinking about that. But in my head, from my experience of going to the field and being very frustrated in many times. I think the preparation is quite important

PARTICIPANT 2

Could you tell us a bit about yourself, and the work that you do?

(...) a lot of my career is based around this knowledge exchange, so I started off as a graphic designer a long time ago, that was my work that wonderful producer who introduce me to project management and knowledge management. So we took 18 month in a project. We had the project mapped out on the wall and the stages of it, and we had meetings and internal tools that I haven't seen before for sharing knowledge. I started to get involved with that in initially helping themselves to find it really really useful to be engaged with project management and knowledge management tools. I left London and since then, I've been working as senior person of in one form or another in agencies, and always around bringing in changes that how the knowledge is managed.

So, in one agency I was brought in fresh occurrence in London to bring best practices into this company. It was 150-140 persons software company that had maybe 25 people were in creative department, everyone else were software engineers with a few accountants and things like that. My job there was changing how knowledge is exchanged and help creative practices within teams. So initially was how to approach customers and what kind of meetings to bound with them, what knowledge to pull out of that meeting, how to store it, how to package it, who to give to and what circumstances. Imagine a lot like throwing meat into a sausage factory, it goes through a series of steps and keeps grinding machines that keep processing different stages and at the other end it comes a pork pie or something. So I was building a workflow to get these account managers to talk to the customers, and the various people in the creative team, including the strategists who mostly comes up with the plans to a large degree, and the various creative team members who are actually, in a work and do the work, and the programmers and designers to get them to function as a team. The reason that it was an interesting challenge, first it was in Spanish, so I had to learn the language, from the actual point of view didn't work. Being a hundred and forties was pretty big for this kind of agency but still it's small enough to have, we had limited budgets, limited in a sense that we couldn't just put 20 people on to doing work, we had always to strike the balance between how to getting bank that up and get value out of it. So have a past knowledge about it in an effective way if we could get it out some of in a meeting, and it does do too much damage, I'm putting sales a lot of money, and that's great. So I had to be efficient and move this knowledge around.

It's interesting that we had around eighty or ninety total customers, and around 10 or 15 those were regular customers, and three or four of those gave us quite sizeable portion of the income, and they are the main three or four the mains we worked on for three weeks out of month or something, and the rest of the time was the craziest most of the customers, and these meant customers could have their knowledge exchange because they worked most of the time with one customer, they really got to know that customer, so knowledge exchange was helped by the fact people didn't have to change customer very much. So it

was so much fun, I have got to bring in stuff around and mapping out customers, mapping out the marketplace, mapping out the business competitors. SO that sort of tools that were familiar in management schools saying but it was totally needed in the design teams, and stuff around. So, mapping customers and customers segmentation, and started to do things like ethnography, starting before I was aware of the term design thinking, starting to use all of the practices within the design thinking, aside from the record prototyping approach, aside from that all the other practices, we used in the agency, and it was so cool things like the use of ethnography, we did things like a really small micro experiments say going to a supermarket and look for certain product that would be purchased by our target audience would be, if it was convenient to find it there, we got people in the supermarket and got their time to talk, and ask them a quick question, stand there for a half and hour and talk with a series of people and bring that small bit of insight back, and use that to inform experiments, so it was so much fun. It was really effective, really cool, and transformatory for the company. (5:32)

To finish off in about two sentences, I since when through the same thing in a British company at a much smaller degree, and the same thing in another British company. One company had around 30 people did marketing and really wanted to change how the company operates in a large way, so I kind of repeated the process at some degree, change the work but this was even deeper, even making the software architecture for how the file systems operate and make, leaving nothing untouched, making all of the documents where the things are put in a certain bits of the form, and change the form in many form in drop in version through a year or so. In these meetings, filling in these sections, and following these instructions, passing to that person. The reason it was so much in depth is that instead of having eighty customers with four being the bulk of the work, we had something like a thousand customers with a hundred and sixty being active so people sometimes work with a customer for a little as 40 minutes a month, so people having no idea they worked with hundreds of customers since I last touched this guy. They've got to be able to bring the knowledge in really quickly, work with it, and package it away again, so get it picked up by the next person, somewhere else and in different circumstances, including any learnings, ideas and insights that happened. That has to be done in a way that strikes the balance of getting bound in your buck. These are low press customers, and so there was so little budget, we really had to be frugal and clever how to get that in, and how not to be fancy.

What is your background?

I'm an artist by soul and spirit of an artist, probably my longest consistent sort of role.

My background and presentation

Do you want to ask something?

What is interesting to me I spent so much time, professionally, systematically changing individual tools and workflows and combinations of tools, from a defusing experience perspective. And yet, what is so surprising to me is that I've never been systematic in I've rarely been systematic in the process I used to modify tools.

- So this is the kind of methodology I'm working in my research. It's too, let's say, formalise this knowledge people have, and make it alive. Because we all have this lets say practices, but we don't know exactly, because I was theorising when I developed this framework, but I didn't know how exactly it would work in practice,

when they were developing these improvements, these changes. So that's why I worked to see how it was working in practice, you see this is the framework use it. It was kind of populating the components to help me how to understand more, what I was doing. Because then, I could have this in-depth knowledge, which I didn't have before, in each component. How they would really actually improve the tools, that's how it helped me to understand, my own framework in my own practice of improving tools. It was me improving the tools, it was people improving the tools in their own way, because they had the knowledge, it was kind of a different approach. Instead of looking at the user experience approach, they were already the users, they were already the experts instead of me trying to extract the information from them, and come up with improvement. No! They had their improvement. But what they were basically doing, they were saying what to do, because the information was embedded, it would probably so difficult to extract this information that I wouldn't do something better than they would do. And that's what I believe, because it's ingrained, it's the point they won't be able to share exactly what they are thinking or doing, but if they can do it, and say exactly how they could do it, that would be I would say more fruitful experience.

1. Does this framework relate to what you do?

It relates to it because it's I've seen on two occasions this time and in the workshop. To offer a comment, I would need more time to understand, what are the alternatives, to see this working now. How this is put together, what the thing you've build in on, to see if I agree with the end result. In a sense, it makes sense to me that there is a level of doing the user experience as a person actually participating and person's facilitating, and a combination of user experience and strategy, strategically informing the person. This design of the whole thing, and making sure they have the right information available, and they are aware of what options exists, and the objectives are, and so on. And more knowledge the more inexperienced people have on each of these stages, the better would be to do, I can see there is. It's like. The only off the cat thing, this is the purpose of this is to get your PhD. The wording is for a PhD assessor at some point. Ok if you want me as a bud sitting down like in the workshop to understand it, I would re-word this. For instance, I would change this word for workshop organiser, as no one would understand, workshop facilitator, workshop application? Workshop attendee, participants are completely clear. For these things, I would reword them if this is to inspire, to improve ourselves I could be questions, a call to action questionnaire website: How you can change the wording to be more appropriate for the workshop attendee, how could be the materials be designed more appropriately for your attendee? And again, that is a need for something else, to even believe that was a correct thing to say. I would say testing with 50 people, and make that change, and see if it makes different to 50 people, and get the data as always through the user testing.

I think I'm already doing for the research, which is prompting these ideas, and since you are giving me different ideas, for my next research.

Wonderful, very cool.

It's interesting, it's cool, I'm still, I would need to know, the purpose being, the main purpose is to get a PhD. Then, if Leon is happy I'm happy. Who the hell I know compared to Leon. He understands academia, he knows how to write a PhD so fantastic.

Practicality of it? I want to know to see specifically, because this exact table who is going led this in what circumstances, and if it was. It could be reworded to more useful preparatory for engaging at that moment. I was confused the other day, it could be clearer to me, more punchy. It could even be, when you laid out those questions, and immediately start thinking

through myself without aid, with that piece of paper alone, would be enough to help me, make sense of the framework. And I understand it more now, must haven't talked it through. The thing is I'm not clear about is: I know it could be arguably used for anyone, but who is for print ably in the sense I successfully designed mountains of frameworks that it would have made big differences to profitability and takings of business I worked in. I made interfaces for Mercedes and peps. I've modified a lot of tools, as individual pieces, and a lot of collections of tools that connect one to another, and the storage systems behind own its own. And with all of these, I used systematic methods for much of it, but if I was literally just sitting down with a group of people, I would use. I don't understand who is this for in the sense I've been able to perform my job without it, and it's for somebody who doesn't really know what they are doing, whose are very caring member of their local church and they want to help their local church or youth group, or something. They would facilitate workshops together, then I feel like the language is way off, and I could be in a much more simplified kind of sense, much more easy to read or something. I was almost asking the question, who is this for. Because I don't know who is this for, I can't comment on the suitability. It's a tool, until I know and the context, I have no ability to comment. It's the spanner to heavy, is not the right size, etc. I need to know the context to feel that I can analyse it.

It is cool that it's a kind of thing I find in an academic paper, which is great. I can even picture having very small link underneath, references, for who is this stuff come from. If you share that with me, I can really see it. I can also picture it being IDEO. From the guys from the IDEO, sitting with graphic design junior with that human-centred design 92-page workbook. They came up with simple graphic designy alternative fun questions or something. I can picture it being re hashed in more friendly gentle approach format, with questions. That could be a really useful punchy start. It feels useful, whether how. I feel more useful for people who don't know what they are doing, and it feels more useful for those who have nothing and sat there confused.

I could definitely be improved for most contexts, I think for how it is presented to people, and I'm very interested in it. I'm very interested in it, and I don't have the ability of actually offer evaluation.

2. Does this research make you think about things in a new and different way?

I don't know. I have to reflect more. I think it's another way of systemising the types of opportunities. It's another way of organising the type of changes that could be made in a situation, so that's not new for me. This arrangement is new to me. So in that sense it is a new perspective.

3. To what extent is this framework useful for what you do?

I suspect, I guess it's more useful for people who have less experience, in make changes in things, and I feel is worded for Leon that useful for amateurs. It's my suspicion, I don't feel in either camp, I suspected.

Understandable?

It was only understandable when it was explained to me. So that tells me that is not understandable. If it's reworded as I suggested that would be understandable to me and to secondary school child, I think. to make it more understandable. That could greatly reduce its effectiveness, one huge way tools can be useful even it's not understandable at all, it's by the credibility they bring. So an expert with a solid CV, coming into a company with a tool, no one else can understand, and then doing some serious analysis, and talk to the people though it. Just by the credibility could be such a factor to often that understandable turns

into the slightest. Credibility can make such difference to move obstacles in the company, and make change happen in the company.

4. How might you apply this framework?

I would apply by keeping it in my mind, now I've seen it. And when I see opportunities to be used. I would contact you, and then if it's useful for your research or interest. Then you can have a crack up, and take advantage of that opportunity. I'm interested in it, more from an artistic perspective because it delights me. It delights that part of me. I described as my soul, but it delights me. I think I would be most likely to use it. My approach covered these points anyway, that's the thing, so many people don't. Depending what you mean by these top sections, a tragic amount of planning and systems don't take account of the purpose of the system, and the context it operates. So that specific framework, on my good days, I do that stuff, and on my bad days I rattle things through. How I might apply it, if I bump into an opportunity I will keep in my mind, and if I see an opportunity. If I'm talking to, if I'm bumping into a group of keen amateurs or whoever this might, non-trained people this might be appropriate for, then I will pass on the link.

And I would be very interested in being around to observe, like a session when you sat down and anyone and any group who work on their own tools with an invested interest, not like the workshop we did, but like a two day session, with the group of NHS people around. I made knowledge management systems for NHS trust in Berkshire. And it was to manage, to find patterns in the data, to help to meet the key performance indicator of everybody who enters in a four-hour period by backing up for them. Amazing, antique Leonardo of storage system for the data warehouse thing. So how I might apply it, I'm very interested about it.

5. Which limitations do you anticipate this framework might have, if you apply this framework in what you do?

Two big ones are, I have to see it in use with real users, otherwise I won't be able to comment at all already. That's the key thing. If you show me a spanner, and ask me how it is used, but I've never actually seen and used in real life, but real people. So I only have guesses, but one of the big ones is when you say many people have the knowledge in their heads, to some degree I feel that's true, it often needs to be brought out through conversation and through activities you might be doing in a day to help populate this, in a very large way. It's almost standard practice to get that information, visualise on the walls and referred this during the session. One reason it's standard of practice because it really works, when I have that idea and stick on the wall, then it is still visible three hours later, or tomorrow afternoon. Who are the end users? Yea. They sat in the room, fine, but that's okay if you have 90 minutes to solve something, if there is limited resources that's great but it makes such a difference actually, reflectively considering ourselves, and put that information away. We couldn't really access it, and using that to inform your changes and things. As a loop of that space there.

That would be a huge change I would make.

6. What further developments would you suggest me to improve the framework?

The first thing I would say: Concrete, rock solid, clarity. Why the framework is put together at all? What is the success criteria are? And what the context is? If the primary objective is just to get the PhD and I'm sure it is, I'm absolutely fine with it. Then I will make sure that, we understand all the success criteria. If Leon is on 100% clear, whoever has to be clear, I get clarity. That's the thing, to understand what is this for? What is for what the goals actually look like? And how close is this to meet these goals? If the academics are not really

important and what matters are about making a difference, than that's to make getting clarity on what kind of context it is we are talking about, and then modify it to that context through repeat and testing. Because having that, I might be literally the case, the kind of meta-level no one ever sees only and you supervisor see, and there are two or three flavours of it, that sit underneath there modified and useful with in an appropriate language and stuff in.

When I modify things I would start with an understanding of the broad context and success criteria, and anything which wasn't leading those in appropriate spending company's money paying me to do it.

That would be conceptual level. Absolutely. So in this module is the design level, there is a lot of designs getting done, tragically without understanding of the strategic level which is about the design and how it is supposed to be happening anyway. Here it might be in the design level. If I was to design this workshop, to go with my company to design to interact with some nappy buying parents, then strategic level above that would be: what design agency want to be involved in? which businesses are appropriate? The financial package of the agency, what we are doing, how we add value? Which markets we are competing with and which don't? How we are going to brand ourselves? And these interactions that make a difference. Is this all just a trick? Is this just a search for business? Or we are doing this just to get 20 rich people talking through a day, hoping to get their business is there any purpose of it. If that is strategic reason for it, it's even happening at all? Then that changes quite of things. We want to help to make the experience, wow these guys, we will tailor based on the understanding of their needs, and what factors might make them to purchase our services. So the strategic understanding, why is happening in the first place, then we can tailor towards there, and for me, the big part of it was the strategic understanding of what was happening combined with the actual delimitations on the ground of the system and the people doing the work, and the time available for them, and their knowledge. So, if this has been done for analyses, it can be worded they can be more moving parts and it can work in a deeper way, and look like more like the other sheet, unfolded and stuck on it. Or there might be more sells whatever it is. More inspiration. And if it is for toddlers, it might be really simple, it might begin to this and might not deal with that level and (inaudible) squares. So if there is time for one, if there is only time for one just a conversation, so we got. Some inspires from the wall, the experience being tailored, and a strategic understanding of why this thing is being done to inform our thinking

PARTICIPANT 3

Could you tell us a bit about yourself, and the work that you do?

Lecturer at Dundee

We run workshops over the last two years that looked at designing for (inaudible) what some of the challenges are that people face when they are creating digital services, so we start off by asking people lots of different things about permanent, situation, impediment, accessibility and move through actually do this, and talk to them about the ways they can improve their digital services based on what they are doing. We used the same idea of the framework, when we are talking to primary school kids about accessibility as well. But instead of us going to too much detail we try to take it back to more fundamental, we change around a lot. So that's another bit of work I do.

Other work I do on the top of that, is PhD students supervision, masters supervision, administration, and all those sort of things as well.

Do you use any tool in your practice?

Not really, what we do quite a lot of the time we, anytime we come up with workshop we want to run with kids, we start off workshop we previously used before, or research techniques we previously used before. Then we figure out, what can we do to take that, and deliver it to kids, keep the same message through the entire of what we were doing. So another example of this would be, an activity that I was doing last week, when we were going to schools and teaching primary schools about conversational AI. It's a lot of work going on here about conversational AI, but we haven't managed to go to schools and do it. But we were able to create a small one-hour workshop, that let us going to primary schools classroom that can start about 7 or 8 years old and we talk about the basics conversation AI and sentences structure, and how things like Alexa and Siri actually work, so quite lot of the time we don't have any tools per say that we use, a lot of saying and trying to figure out what are the bit of the essentials that we need, and we translate that so other people can understand, depending on where we are going. Whiteboards and post-it notes.

My background and presentation

I would like to draw on your experience in tools or collaborative practice/research, and ask you a few questions

1. Does this framework relate to what you do?

It does. Looking at it now. I'm realising how it applies to some of the things, we've been doing. Let me see if I can get you a quick example. So we do two workshops, design for accessibility and accessible design for pirates workshop (<http://accessible-reality.org>). And one of the activities, what are the different sorts of challenges people have with accessibility. So on our designing for accessibility workshop, what we've got is we hand out this thing, what we call an application. So with this, we have categories along the top, and we got different thing on the sides: Permanent, Temporary, Situational, and accessibility issues. And one of the activities we got participants to do is to fill this in. So this is the workshop we do with university students, and to businesses. What we want to go to something very similar with young children (Worksheet). So what we do with young children is what are the challenges that exists for a pirate? So a pirate face accessibility issues, they've got a eye patch, parrot on their shoulder. So these thing we got left on the left hand side match up really well with our previous workshop that go along the top. What we are doing is changing wording, the design of materials, so they are getting the same thing, but I'm guessing on your framework that would be, the challenge / briefing , up with instruction and design, and interaction models with function and design. But we are changing the overall workshop so it's more suitable for different audiences, so we are doing the same bits and changing a little bit. So, yeah the stuff you are saying makes complete sense and I think it works well with the things we are trying to do.

Interviewer

So I think is the wording there, so once you start to explain what the tools were, oh yes we do, we call them worksheets instead. Because everything we say tools, we mean digital tools. So as well as those applications, to help with the facilitation we also go up on the website the different, powerpoint slides or presentation we use for adults group and childrens group. So you can have at it as well, and show the difference between what we were doing. And I think we got a one page summary as well, so even in terms of facilitation notes, we create a different set of facilitation notes.

2. Does this research make you think about things in a new and different way?

It does. So when we were creating these workshops, we created the design for accessibility first, and we decided on what the aims were going for, and we worked through all the different bits. I'm actually going to show you one more time.

So whenever we are designing this workshops, we follow the same task every single time, and we've got a little bit of information about that. So, we all go through these different phases, with all these different pages, we've got a little bit that explains how each of these workshop was made. So start off with these idea of idea generation, workshop layout, the idea generation kind of (connection problem)

With each of the workshops we make, we go through a workshop development cycle, and in this cycle, these are steps we do. So we start off with idea generation, and finishing with paper generation at the end. So any time we were doing this, our ultimate goal was to try to have some form of, or one of the goals, was to have some form academic output at the end. So with this one, we've got this workshop into CHI, we made it, we run it with hundred and seven people, and we did the analysis, and we got the paper out from it.

I think the new idea you are bringing to this, that I really like. It's let's start with the overall challenge first, and then use, instead of coming up with one method of doing it, I think it's really interesting to look at workshop creation as what are all the different ways you can try combat this challenge? And then figure out what best way to do that based on the demographic that you are working with. Which is a new way of doing it, we were always looked at it as a "here is the demographic we are working with, let's base the tasks on this" but if turn around and "here are all the tasks premade, and let's see the demographics and pick the right tasks for it". I think that is a more scientific way of doing it, but then you have more time to think about the task before you run them, and if you do need to make things up while you are there, well because like you were saying at the EAD people were talking about into the flexibility and the openness, and well you've got all of that stuff made and available and it's easy then for you to use it. But I think if we are do things the way we currently do, (...) if we arrive on a situation we don't have materials based on where we are, we just make them up on the spot, and if we do that we can use in research. So it's good as an activity for the participants and in terms as an activity we can use in our research studies, well that protocol hasn't gone through ethics, so we are not allowed to use it. We don't know how to reliable the data is, because we haven't sat down and came up with a methodology for all these groups together. But if we turn around first, I think makes a lot of sense.

Interviewer - I see. Because imagine that is not you who is delivering the workshop, you have a team of people delivering the workshop, and then okay "I'm going to deliver this to kids, I'm going to deliver this to adults, and then to deliver this to hard to reach communities in highlands. So you have one tool, and start to think who are the people you are going to engage with, and make it suitable for each audience, instead of going one by one, and you kind of create reproducibility for your research.

3. To what extent is this framework useful for what you do?

The fact that you got something on paper to work through helps a lot because it means. So the next time I'm going to do the workshop, I will be taking the matrix, and sitting down, and think right let's think about the challenge we have first, so it gives you the steps on what you need to do, I think it's really useful now in that kind of way.

4. How might you apply this framework?

If we were going to use it, we would use it as a method to structure our thinking when designing workshops. So normally we would go through the linear process we had I showed

you before, and start off with idea generation, and work on the different bits. Whereas now, I soon you do the idea generation we've got a better understanding of what other things we know we need to consider? So instead of going this linear path going downwards is more like sprawling nets of different things we can look at. So it gives us the opportunity to start to look at this, and if we start to use this framework, and then I would even mind having that printed out on kind of a A1 paper stuck on the wall, and put a little bit of post-it notes on itself, as a way to start thinking about all these different areas, and if you start to colour code the post it notes, if you say well red post-it notes demographic, and green post it note demographic, blue post-it note demographic, and then you can start to fill up the thing, and it's a really quick and easy and visual way to figure out what is you are doing and all the different other things you might be comport as well. I think that would work quite well.

5. Which limitations do you anticipate this framework might have, if you apply this framework in what you do?

I don't know if it's a limitation of the framework or it's just the limitation of doing this kind of workshops. It's the idea of flexibility, and where you fit in this flexibility. From looking at it, the flexibility seems to be this iterative thing, so any time you are looking at how to make anything more flexible, it does kind of feedback to itself to into the other areas, so when you are thinking about your challenge or your briefing, and then you go along and think "Oh ok well, what is the appropriation techniques, what is the facilitator responses you automatically have to go back, to the start again just to double check everything if it doesn't work. I don't know if that's a limitation, but I think it's quite a useful thing Ros to do.

Reflection on flexibility – Yea, when I was presenting to you. When I presented it to you, I said the first two is what the tool is about now, and third one, which is the flexibility, is what the tool can do beyond that. Because there is some unexpected circumstances, like when you are designing tool, and people take this tool, so imagine if you have a website and "Oh I really like this approach I'm gonna use this to my context", and then, they look at "you know it's quite rigid it doesn't work really well I don't know in London, for instance" because they have an approach which they already know, the people they are engaging with, but that is "London is more cosmopolitan than the other place, then we need to change this" and at the same time you have approaches that don't work well if someone is taking your workshop and delivering in a different place, so it's more about giving more really flexibility to the tool, so it can reuse and relearn and at the same time used these tools in their own practice.

Our pirate workshop, I presented at a conference one time. Then I had some companies getting in touch with me, and say "we don't do much accessibility, and I really like your presentation, are your materials available? Yes, they are all online go there and do whatever you like with them, and then they came back and said "All it's great, we change this to this to this". So yes, it's good and I think the issue is there are different ways we can look at. You can look at the academic standpoint, and I'm quite like you, my main background was quantitative research and then I moved to qualitative and finished my PhD. So I like rigour, I really like rigour, and I really like to make sure I'm going to be presenting something, and go be submitting something, and I want the rigour to be perfect.

So from a scientific standpoint, it's "we don't want to be changing stuff in our own studies, but once is given out to other people, I think is really good you give them the opportunity to basically remix it and do whatever they want to do.

- Interviewer – Through this conversation you can't assess other qualities of my research because you are not reading it, but at the same time you are looking at the pragmatic side, is this really useful or not? But it's kind of approach, because then you can get an unexpected outcome as well, how do you call it technology and computer interaction? Serendipity. And that is sometimes might be what you are looking for, because you are

dealing with people all the time, and you don't know exactly what they think of the situation, so people coming from everywhere, so you will see people from totally different backgrounds, and if you kind of make the tool more flexible, you might get these unexpected outcomes which is might be very interesting.

6. What further developments would you suggest me to improve the framework?

I think it would be useful to have some working examples of it to see how you've used it in your own work to kind of adapt different ideas people come with and present it to different audiences.

The fact that it is, it is kind of a temporal thing, so the framework you make on the one of (rephrasing)

It is a very temporal thing, so the framework people come up with on your matrix on day one, it's going to be completely different from a framework you come up after four months after running things. So I think it is worth looking at people to think at how changes have happen over time, and why changes happen in this way as well.

- It is another framework or people think over time?

It is people using the framework, and looking at how it changes over time. But I think one of the things are working examples, and find a way you can show people here is how I've done it, and then you can try the same thing. Or even looking at how it can plug in with other methods.

So, any time I'm doing UX work together with other companies, this is my cheat sheet. I try to figure out what of the part of sort of the double diamond because it's easy to understand, what parts of the process we are looking at, and the different techniques we know as UX experts work well for these different areas, and then from that, I can plug them in, if that idea of the application stage, and going through things like: Here's the things that might work. So maybe, it might be worth trying to find out, if you are using this technique, this might match up and leading well with other one. You might also consider that, but it kind of come as predictive, it might be an idea to look at. And see if there is any there as well.

PARTICIPANT 4

Could you tell us a bit about yourself, and the work that you do?

I'm running workshops sort of several times a week, I will be running a few workshops. It's basically design as an approach to innovation, so I work as designer strategist and I'm working for a technology gateway an institute of technology. So the gateways here in Ireland, we own fifteen gateways over eleven institutes of technology. Basically, they are the gateways and retreats to engage with researchers and institutes, and the particular gateway I'm working with is designed focused. So the projects come in through a design approach, so I work with them usually at the early stage of innovation on scoping and framing, and ideation and identifying innovation, and moving them to concept and concept creation. So, I work with all sorts of different agencies most of them SMEs, but they could be engineering, the could be coffee shop owners, could be IT, buffalo farms, you know a complete mix of companies, ranging from, a simple employee from a turnover to a large multimillion turnover companies. Our aim is to help them to understand the process of innovation, help them to identify innovation and help them set on a pathway that they can implement an innovation. (...)

What do you do in these workshops?

When the company comes, for the units of measurements Ros just to give you an idea, they come under a government grant scheme. So they come with a package within that I will generally hold four workshops, which are two hours long each. So for the four workshops, usually we are starting, they generally follow a general pattern but we have to be ready to adapt to at any time, obviously, with the companies being really different and their needs are very different. So we generally start with scoping and framing to approach to them to the company, existing stage, players, what resources are, capabilities, areas of expertise, the general activities they do, all the sort of stuff. I'm looking for their face for innovation, the capacity space to innovation for the first place and what all the resources they have around them to help to evaluate and any ideas that they have. So that could take one or two workshops, and that is once a week because we don't have a (multiplex) together to allow reflection in between analysis. Basically, over the workshops, we get them to the stage of ideation when we begin to generate new ideas, and we show them our mechanism to generate new ideas, and evaluate their ideas.

Which kind of mechanism you mentioned? What do you mean by mechanisms?

Ok so is again going back to our toolkit, the approaches that we designed with toolkits around. We have an innovation toolkit and we have (starting) toolkit at the moment, so we sort of building and adapting those as we go, sometimes the adaptation are existing sort of templates from business or other places we borrow, but sometimes we design them from them scratch, depending on the needs. So there are teams like, so for the first stage we have an adapted version of business model canvas type, for scoping and framing but adapted to our own, we don't use that in our workshop to be honest, it's kind of a prompt based sometimes so you use it in innovation sprints if we are doing a condensed version of that, maybe over a day and a half. We will use the templates to stir in, what the templates are, and the questions I ask when I'm in the workshop. So people don't actually fill in the template in a workshop, I ask them the questions and their working of a large (inaudible). The other templates are about the ideation, so it's a place to catch their ideas, also how to evaluate their ideas.

The toolkits we use are usually quick, it's a more condensed version of what we do on a daily basis, and if have a companies in and we have a multiple companies in the room for one day, and we use the actual templates, so we condense the work that we do over a large workshop into this template toolkit for innovation that we use, I can use a copy of our toolkit I'm sure.

My background and presentation

I would like to draw on your experience in tools or collaborative practice/research, and ask you a few questions

1. Does this framework relate to what you do?

It does. I wouldn't considered laid out like that, but when you explained now. The top three layers, the instruction, function, flexibility actually make sense. You know as to a building of the tool.

2. Does this research make you think about things in a new and different way?

Yes it does. I suppose my focus before this would be on an immediate need, but I wouldn't have broken it down into a framework beforehand, which means in theory you might miss areas, so it is actually useful to have a check list, a matrix like that to see if you are covering all data, because whilst you can go on an experience, you can go on a need to have for that

particular session or workshop or whatever you are trying to address. You can look that as a checklist to see, you know, if the approach is being made in all these different areas or just even consider them, even if it is not relevant at that time, but at least consider them. I think you covered most of the basis by breaking it down into the function instruction and flexibility, you know.

3. To what extent is this framework useful for what you do?

The framework would be useful, I'm just looking at with the stuff I have. That would be, even some prompts underneath that to break that down a little bit, and maybe I suppose it changes for different people and different tools, some prompts underneath the headings would help. Bring it more alive as a checklist for me, as a framework. Is that make any sense?

Because at the time you try to know what that mean for this project, but it really needs prompts break those boxes out and a bit more detail of intent would be helpful.

And also if I'm not jumping ahead just one of the things I noticed there a the last stuff is focused around the facilitator and the designer of the tool, which is fine because that is what they are doing. If you've done the workshop, I know there are lot of facilitators you are dealing with on the workshops or some of those end users of using a tool. I think you get a lot of information from the end users, you know, the people the facilitators are dealing with, so the end users group could give some insights as well, or the way the facilitator can gather that information for the design. Is that what you mean?

Interviewer - The approach I had in the workshop, I was working with practitioners and they had such engagement with their audience all the time so they kind of know what works for them, and what it doesn't.

I'm just looking across your matrix is there a prompt for them or me, or however might use as a designing the next kind of tool, I'm just looking. You know, it prompts me to consider that check list about those end users I thought it was coming out of the wording, to who you are talking to. It is coming out in, and the prompts probably again I'm talking about, because challenge and briefing for example, and your end-users can, be different but you know, you are addressing, you mentioned old and young, when you are dealing with young people. It's like you know, if you've done that in your research, pedagogy with dealing with younger adults if you like, If you tend to tell them brief and that the challenge for that is for, but with older people it tend to need to tell them why and be a bit more, they need to know why they come and what they are doing rather than just the instruction of what to do. They need to know why to do, so these are the prompts that possibly, if I had it right now I would be adapting myself straight away putting headings that suit me. Is that making any sense?

- It does

Make these boxes start of actually , because each time I go to do what I know check if it is young or old, put the briefing. Do I need to explain why or how? In the briefing. You know if I come to the function, interaction model I have to break out prompts to myself there, and appropriation. All of them, I have a couple of, two or one prompts, you know? It would be helpful, I would be sitting down to design, and thinking about the prompts. Thinking about the challenge / briefing one as being and the why and how, but if there is one for all of them to speed up the process then of the checklist approach in using the matrix. Make it more useful

4. How might you apply this framework?

This is kind of what I do, I do a sort of a checklist prior to design the toolkit. I probably would have a need or a rise of thinking, I need a tool to communicate this particular type of work or

knowledge exchange I'm going to be doing. I sit down and have a blank canvas on to start with, what kind of information I'm extracting, what information am I giving? There you go straight away your first box design and instruction, what information am I given? That's challenge and briefing. That's going to prompt me to know that I need to do that, I need to somewhere give the information whether collect information. And you know the function, interaction models okay, how they are physically going to do this? You know is this going to be right in on the top of it, it's gonna be you know? Add things to stick to it or what is going to happen or how that work, you know? Just those sort of prompts so I would probably using as a checklist as I'm going through, what I need and like I said if I had few more prompts, probably added, and I would add overtime as I'm doing as things come up in practice. Experiential using designing things, I'm sure you naturally start adding those prompts in.

5. Which limitations do you anticipate this framework might have, if you apply this framework in what you do?

The only thing I would be looking at from using tools myself in that approach is sequencing, so this tool generally speaking is not going to, in my situation, will not standalone. It comes sequentially before or after something else as part of the overall process, because you are not going to do the whole process in one tool. Generally speaking for me anyway, I would probably use five different tools and bring them in a sequence, and so in that case, I would need sequence, where this is, what I'm doing, just to go according or check list or make notes of it, or prompt me to know, what I'm designing for in a sequence. Maybe one thing, I'm more focused on the design element to be honest because the facilitation, the facilitator notes when they come experience will add to this itself as you suggested before. Once you design in a way that allow it to happen in the first place, so it keep me coming back to the top line, the design three boxes you know. I think, the rest of those if done right, so you know challenge / briefing okay so that's instruction, function what we've got to do, how it's going to be adapted. So the broad headings still aren't they. My only thing really is the broad headings you know? appropriation that is such a broad heading for me to actually access when I need to sit down, and design, there is a lot within that, and it's amazing. Better the same few headings repeat nearly all the time, you know? nothing would be million, so I would probably, a small few to actually be enough. But I do feel the design would take precedents on that box. Because I feel that if you done the design right, the head of notes would be right, the facilitators and the adaptability and flexibility and use would be right. And the wording in the design, because you know from the instruction and challenge and briefing if you are talking to you will be getting the wording right, and again that would be one of the prompts, old, young or whatever prompt is intuit for. And that in its turn would explain if its okay, old or young or whatever it is and prompts, I need to like I said before, tell them why as well as the how adults I need to tweak their language and that covers the wording in the application, and you know. Think a lot better the design I know you design up first, which is again in sequence the right thing, look at the design, and then the facilitation and the application are more follow on checks. They all fall under the design, but anyway it is just a thought.

- You know sometimes you are not the one delivering the workshops, so you might have to design the workshop and the others are just going to be facilitating. So if the others are just facilitating, if others have delivered similar workshops before they would just give different facilitator notes, so people could, like do a better engagement with the specific audience.

Yes, so if you look at the facilitator notes as toolkit that work or any other tool that work, they usually have sort of small prompts on the main heading, but the small prompts actually guide the facilitator as well as the user, so I would say take five minutes, and think of this and this, you know? Almost prompt, and also giving the time, and instructions and the facilitator

notes. Spend 5 minutes on the first box, and you know whatever, it's kind self-explanatory and helpful for both, if you get it right, you know? I said it as an important part of getting them right, you know? People will interpret in different ways, and again is going back to the problem of being not restrictive in the usability. Because if you give too much information in your box you might undermine other surprises that might come otherwise that people might choose to use in a different way. At the same time, if you have an intent of something that you want to extract, you do need to have, some boundaries to get that information.

- It's interesting to say that because the instruction can work for both, although sometimes they let's say in the backstage someone say what you do, because it's something more specific. I worked with people from SMEs before, and if you say this, this might prompt them to say more things, and now the detail is going to be in the tool saying facilitator will say to you, and be prepared or could work for them what they going to say, but yea, it's interesting what you said.

The difficult one with the facilitator instructions is because you don't want stuff on the sheet but ideally you don't necessarily want a heat of stuff outside of the sheet, you can get all in one sheet or the better you know? For facilitators. But it's coming down to what, you know. How much the... have ever done seen for example the lego challenge, the brief is quite a lot for facilitator as well as the user can't see what the facilitator doing in that case, because that information they are not suppose to know, until they done what they've been asked you know. Do you intend to have facilitator notes separate to a tool is that allowing for that, or aiming to design everything in one sheet?

- It depends on the designer's approach because you can sometime do in a separate sheet, sometimes it's a generic for both. Some cases you don't really need a facilitator notes there. It really depends on how perceive exactly like you said. We have different perspectives, so when I kind of separate in three layers. It's just because it's the perspective people are bringing to how you look at the tool, so you look at how people will facilitate this tool, you will look at the instructions in a different approach, in a different way. If you are looking at the instruction that you are going to give to the participant when they are in the workshop, you are going to be looking at their perspective and start to tailor more communication that will suit them more. Let's say

6. What further developments would you suggest me to improve the framework?

I'm going through your headings and you know back and forth. What is missing, any gap, or anything that is going to be missed, something in the design someone not covered on any of those headings. For consideration.

The other thing there is again, in the design of the challenge / briefing the models and the effect on how it is used, and the other important thing you have to look at the reflection or the outcome or some way of accessing what is being captured then either through reflection or analysis. Is there some way on the sheet on the back can be done or something else we do. The analysis, the reflection or the extraction of the information. It might be necessary for all tools or that just the only thing I can think of, and I think everything falls under one of the other headings.

- I see because challenge / briefing is addressing the beginning of it,

Yes but it is the end of it what I'm saying, if there an exact dash for the end, you know which is the close, and the capture of what overall was captured there. Was you know the key

things that came out of that, and what do they mean you know. Add some way of do a quick analysis, what is the finding and what is that mean to project or the work. I'm just being told, that is the other thing.

- It's kind of there, but it's not there

It's what you are extracting yes. Apart from that, most of the elements, of anything in approaching to find other tools for workshops would be covered under those headings

PARTICIPANT 5

Could you tell us a bit about yourself, and the work that you do?

I'm actually moving jobs completely. But at the moment, I am studio lead tutor / researcher associate at innovation school at Glasgow School of Arts at the highlands campus. I have some strange connection, have seen the original Leapfrog project, but was never involved in Leapfrog project physically. But I have seen it from the beginning, so would hear stories and kind of see the kind of initial development of these stuff, and kind of all moved down to Glasgow at some point at the last end of that.

My main role here is I teach on the Master's in design innovation programme, and I teach everything from studio, theory and visual mapping, visualisation, workshop, participatory design, knowledge transfer, everything in between.

What interested in the workshop at the EAD conference?

Well since I am someone who runs workshops all the time, I was interested in seeing what somebody else sort of how to make better workshops. So I thought of sit in and experience a little bit on my own, what you would call you know, I have to, if I have to put people through workshops, I should be able to experience it myself and see what is like, and observe how other people run workshops. So really it was a little bit of my own kind of my own research interests to see how other people run workshops, and to hear what somebody has to say about how to run better workshops.

So, when you run workshops or participatory design workshops to engage with people do you use any kind of tool.

Yes as part of, at the core of our work is we develop bespoke tools for each participatory workshop. So depending on the theme or the project or the idea or the needs of that workshop, I will use either, and I'm quite loose with the term tool, so it could be anything from perhaps an approach, that allows people to engage with each other in more oral conversation and kind of dialogue to then actually printing out worksheets or more like visualisation, to then all the way of kind of making a tool to perhaps promote collaborative understanding of complex issues or actually co-design a thing or a system or an idea. So, we use everything from post-its, posters, worksheets, pen and papers all the way to you know laser cuts, and you know, specific kind of artefacts to enable these conversations to promote visualisations and better communication and understanding through participatory workshops.

My background and presentation

My one question is this matrix just something that you are using as kind of descriptive form or there is something that say a community, participant can use as well?

Interviewer response – That’s the plan. So let’s say it’s kind of the tool, I can use to prompt people to think their practice and how they could improve it. So that could be for any kind of practitioner, it could be for you as a designer, or could be for practitioners that work in the field of patient engagement for instance, then they would look at their own tools and see if it is appropriate for their kind of patients they are engaging. So not necessarily this framework is for designers but anyone else who do any kind of engagement with people to understand or build community or do this kind of creative engagement approach.

1. Does this framework relate to what you do?

So I guess, my main thing is I don’t necessarily think of it in such a discrete sections. I tend to kind of it’s been quite intriguing to see it divided out into this way of thinking about what is the design of the tool, what is facilitation. I guess in the way we teach, I teach my students on how to work and create tools, we discuss its purpose, the audience and the intent of the tool, and its usability and I guess then whether is a tool to describe, to link or tool to say retrieve information, like so that how I can teach with my students, the usefulness of these engagement tools. That’s how we approach it, so I like seen it in another different way. So for me that’s we tend to create the engagement tools, we try to promote tools to be as simple and easy to only make but also to use and try to create tools that are not overly difficult or require a lot of explanation, so even the simplest pen and paper its sometimes better than say creating some sort of artefact or something like that. That’s not always the case but sometimes, all you need is pen and paper, and state please draw this out that brings about a better conversation than anything else that has been done. So I think that how I have approached this kind of understanding of engagements, tool development in say participatory and co-design approach.

Interviewer – It’s kind of you are saying that there might be some specific components that relates in a way you teach your students to design tools, is it what you understood, right?
Yes

2. Does this research make you think about things in a new and different way?

Well, like I said, it gives different perspectives on it. So I think provides me with say something I could maybe adapt, and to maybe the way that the terms are used maybe not the ones I would use, but I think is useful to see say like like the instructions of the tool, the function of the tool and the flexibility of the tool, and I like that concept of the flexibility of the tool, and being able to allow the tool to be appropriated for future use.

So, the tool’s life goes beyond say, the life of the workshop that carries on into other workshops (inaudible). So for example, I have used a simple, I ran a workshop with a group of textile practitioners a while back for my research, and I found a simple laser cut trim looms, it’s a little flat laser cut loom that you can wrap up a piece of yarn around and then you can use little cut pieces to kind of weave a little section of plot, and it had their names on it, so it was tool that allowed everyone to their names first, and was also a tool that allowed them to create something, but then also gave them something to have up to the fact they could take home, and then kind of engage as a way to experiment with new ways of create the plot. So, I like the idea of a tool can live on beyond the usefulness of the you know, of the life of the workshop.

Interviewer – Well that’s why I came up with this kind of framework because it’s more like you have tools everywhere and even designers designing tools, they can be reused in next workshops like you said, so but at the same time you cannot use the same thing exactly in the way it is, and if you look at the framework, and then you see: hmm the might use in the future, that would be interesting for them to appropriate, and or even others like you might design a kind of workshop, but then someone else would deliver it, and somewhere else like

'you have to go to Forres and in the Highlands, which they kind of have geographical language, a kind of wording to express their ideas, so maybe we should change this or that. So, that's the idea of the framework, and so to look at ways to appropriate and change, and improve it to specific context

3. To what extent is this framework useful for what you do?

I think it's useful like I said if I'm able to adapt it a little bit to my circumstances I think it would be useful as a teaching aid, and perhaps even just as a visual aid in thinking about how do I make tools how do kind of think through the creation of these participatory tools, so yes overall it would make a useful addition to the way we talk about making tools.

Interviewer – Yea, I remembered you mentioned this in the workshop, but I couldn't get exactly what you said, but now with the questions and this kind of structured interview, I could understand what you mean by teaching and the way you design tools, and think about the briefing, and people are going to engage, but then you said, you could use this for education, and I couldn't exactly understand but now I understand more the way you were thinking, because it's then more like I would say reach in depth because this kind of approach rather than a workshop, we had more time to think, and to talk about it. But yes it's interesting to hear that

4. How might you apply this framework?

Well, I think I would probably, so the way we kind of teach engagement right early on we do teaching through doing, so most of the teaching have them go out and do a thing, and lot of these are through trial and error. So, they will know that this thing will work with a group one time and the same thing might not worked another time, so they are constantly challenged to look and create and think about the ways that they engage with people and what are the best with just. I can see this framework used as I say as a kind of added in addition to the foundations that we give them, and let's say a memory aid, right? So it can be something that sits in a class, and we could refer to it, and say you know, if this is this then you can create that, and these kind of 9 approaches to the tool, and depending on different situations you can think about these kind of blocks as a kind of aids to think about tool, and ways to facilitate, not only the creation of the tool but say also the use of the tool and its overall kind of you know impact.

5. Which limitations do you anticipate this framework might have, if you apply this framework in what you do?

For me, I think what I was saying before is that I would probably allow for some flexibility on the framework or for obviously it can't cover everything. So I think either being specific asked to what it is that's this framework allow and keeping it quite simple at least the wording, and to say perhaps then making it so that maybe they are allowed to fill in the matrix, or suggest these are the ideas we think, but perhaps if you are designing your tool, think these kind of six between layers and dimensions as a way to think about the tool, and think about your own. Because maybe even like a suggestion could be maybe don't fill in the nine squares, you leave it quite blank, and maybe this is for say the obviously those can be used for community groups. But if it is for say either you know designers who are used to doing these things, it could be useful not even add text in the middle, and say here, have a look about this, and use this as an approach to thinking the relationship of your tools with your workshops. I think maybe not making it so prescribed, maybe better. Maybe allow it like a version for one particular type, and other that is quite empty, and one that is quite filled in.

6. What further developments would you suggest me to improve the framework?

Don't really know, I'm not sure at the moment. My main points ones I previously mentioned. Maybe there is a way of testing it out down the line, or you going test out this framework with a group of people, I know you've tested it in a sense of trying to understand it. But, will you kind of say sense check it with another group of designers, another workshop where you actually create tools toward particular event with this particular framework. So maybe therefore you can have some insights into its effectiveness, and whether that's part of the PhD is another question. But I think for myself is like if I was to this is a student of mine, I would say "right, let's test it out" obviously my master's students they have such a little time to do anything. But PhD maybe eat out a month or two from something and say alright let's test out this process if work either as a live situation or even if it is a controlled environment, you just kind of use it with your local group of practitioners, and see how it works.

Interviewer reflection – What I found interesting is because I came up with this framework to improve, it's kind of for redesign tool. But what you are suggesting me is about designing the tools based on the framework, which would lead to a different project, if I had to another PhD that could be another PhD or a further action, like a project which I would see if it would work by testing out the components and okay "we are here designing tools, and these are the reasons why you are here, and then I was just prompting them to think around these components and they could come up with the new tool let's say. That's an interesting suggestion.

Appendix Q – Case study review: A3-sized case study report handout

Improvement Matrix

Research question

How can tools for knowledge exchange be improved?

How does improving tool instructions improve KE design practice?

By working on this dimension, engagement practitioners consider their audience, the language used in the tool and how this would be understood. They will provide improvements that support contextual understanding of the tool for those engaged in a KE practice.

How does improving the tool design improves KE design practice?

Participants consider their practice in designing knowledge exchange tools and collaborative activities, and improve tools by providing a more open and flexible tool concept that gives practitioners more control over the KE process and also flexibility in using and understanding a KE tool.

How does improving the tool facilitation improves KE design practice?

Participants consider their expertise in enabling individuals to creatively exchange knowledge, and improve tools by providing indications for uses, practical guidance to facilitate activities, and collaboratively exploring, designing and sharing engagement approaches that work.

How does improving the tool application improves KE design practice?

Participants consider their expertise in engaging with their communities and in their own organisation, and improve tools by tailoring them to suit their needs and practices. These involve suggestions to the communication in practice, making tools more appropriate to their engagement contexts.

Dimensions Layers	INSTRUCTIONS
DESIGN Designers' practice	Challenge / Briefing Activity: KE designers look at the briefing that describes how the tool can address engagement challenges, and then suggest improvements to the manner the tool is used to solve a contextual challenge. How: Designers will observe the context of application, the language used, and the intuitive concept of the tool, and then generate ideas on how to improve the instructions such as: <ul style="list-style-type: none"> • Additional instructions to inspire different uses • Additional illustrated examples on how the tool might work. • Ideas to stimulate discussions • Ideas to enable a more open and flexible system How does this component improve the KE design practice? By improving this component, a tool is improved to enable more personal understanding, providing more flexibility on how to use KE tools in practice.
FACILITATION Facilitators' practice	Facilitator notes Activity: Facilitators look at the guidelines on how to use a tool to support them to enable participants to creatively engage in a KE activity, and then suggest ideas to improve these guidelines. How: Facilitators will look at the engagement resources work using the tool and suggest ideas to improve the instructions such as: <ul style="list-style-type: none"> • Indications for use of the resources (e.g. age indication) • Deletion of unnecessary resources or instructions How does this component improve the KE design practice? By improving this component, a tool can indicate uses of the resources that are suitable for different audiences or that need a more specific design.
APPLICATION Engagement experts' practice	Wording Activity: Experts will look at the contextual meaning of the words in a tool and suggest appropriate words to improve participants' understanding and engagement in an activity. How: Experts look at how at wording on a tool, and suggest new wording in the tool to instruct participants such as: <ul style="list-style-type: none"> • New wording: Catchy headlines, actual words used in the process, general or specific words, straightforward words • Less words • Additional words How does this component improve the KE design practice? By improving this component, new wording makes a tool more user-friendly and appropriate for an organisation, and wider or specific audiences.

Want to know more about the Improvement Matrix? I'd love to hear from

How does improving tool instructions improve KE design practice?

By working on this dimension, engagement practitioners consider the practicalities of KE activities, which involve the tool group dynamics, guidance, and use throughout a KE design process. They will provide improvements that support and enhance these practices of doing engagement.

How does improving tool instructions improve KE design practice?

By working on this dimension, engagement practitioners will consider unforeseen circumstances in KE activities, that involve unexpected applications, creative facilitation and uncommon uses of the tools. They will provide improvements to enhance the adaptability of tools to different engagement challenges and situations.

FUNCTION	FLEXIBILITY
<p>Interaction models</p> <p>Activity: KE designers look at how the tool design concept addresses an engagement challenge, and then suggest ideas to improve the way a tool could enable creative exchange in a group of participants in order to meet a desired outcome.</p> <p>How: Designers will look at the tool group dynamics or interactions with participants of an activity, and generate ideas on how to improve the concept such as:</p> <ul style="list-style-type: none"> • New tool ideas to creatively and collaboratively address an engagement challenge • Prime exercises or roles <p>How does this component improve the KE design practice? By improving this component, designers can provide new tool ideas and features on how to collaboratively address an engagement challenge and also improve the usability of the tool.</p>	<p>(Enable) Appropriation</p> <p>Activity: KE designers look at how the tool design concept accommodates unforeseen applications, then suggest ideas to improve the resilience of the tool.</p> <p>How: Designers will suggest different applications, and suggest ideas to improve the flexibility such as:</p> <ul style="list-style-type: none"> • Additional information to contextualise the tool, such as time duration. • Different formats (e.g. electronic format) • Extended features <p>How does this component improve the KE design practice? By improving this component, designers can expand applications of the tool and give users more control, providing practitioners more space to think about engagement challenges.</p>
<p>Resources produced for facilitators</p> <p>Activity: Facilitators look at how the resources can be used to support creative engagement among individuals in order to achieve a desired outcome, and then suggest improvements on how to guide participants and support a creative engagement in an activity.</p> <p>How: Facilitators will look at the engagement process with the tool and suggest ideas to improve the job of facilitation such as:</p> <ul style="list-style-type: none"> • Practical guidance on how to engage participants through the process • Additional resources • Changes on how to fill in a tool (different inputs for specific audience) • Bigger font size <p>How does this component improve the KE design practice? By improving this component, the addition of new resources and further guidance to a tool can improve the action of engaging with participants.</p>	<p>(Encourage) Facilitator responses</p> <p>Activity: Facilitators look at how the tool can accommodate different approaches to facilitation, and then suggest improvements on ways they could enable creative exchange in multiple situations using the tool.</p> <p>How: Facilitators will suggest how to facilitate different activities, and suggest ideas on how to improve the flexibility such as:</p> <ul style="list-style-type: none"> • Describing how to do it • Setting a new activity with a group • Sharing approaches that work <p>How does this component improve the KE design practice? This component can improve the facilitation practice by discussing how to apply the tool to different activities, discovering the tool, simplifying the tool and suggesting creative ways to use the resources.</p>
<p>Design of material</p> <p>Activity: Experts will look at the features and composition of the tool, and then suggest improvements on how the graphic design is presented to participants of a KE activity.</p> <p>How: Experts look at the graphic elements of the tool (features, appearance, format, text and images), and suggest improvements to the visual communication of the tool such as:</p> <ul style="list-style-type: none"> • Different format (e.g. electronic format) • Different use of the space • Additional captions • Different types of inputs <p>How does this component improve the KE design practice? By improving this component, a tool provides a more friendly graphic communication, clear documentation, meaningful association of visual elements, supporting and enhancing practitioners' engagement practice.</p>	<p>(Build) Versatility</p> <p>Activity: Experts will look at how a tool encourages unexpected uses by participants, and then suggest improvements on how the tool could support different responses to instructions provided in the tool.</p> <p>How: Experts will suggest unexpected uses of tools and suggest improvements to the flexibility such as:</p> <ul style="list-style-type: none"> • Additional resources/features for extra information • Different formats • Editable texts • Suggestion of new designs <p>How does this component improve the KE design practice? By improving this component develops a more personal and adaptable tool to many situations, making it easier for individuals to assimilate the information in the tool, helping them to exchange knowledge in more effective ways.</p>

you! Let's have a chat! Contact Rosendy by e-mail r.j.galabo@lancaster.ac.uk

Insights

Insights into facilitating improvement workshops

1. Workshop duration – a 1.5-hour workshop can be delivered at the expense of a better outcome. Bearing in mind that a longer time to reflect and evaluate the improvement proposals is required at the end of the workshop.

2. Clarity – Facilitators have to provide clear guidance, examples and remind participants about the objective of improving KE practices in order to engage in the process.

3. Participants – The participants' roles and experience, and the number of participants in the workshop might affect the outcome of the process.

4. Learning through the process – After finishing the first task, participants can conclude the next round faster than the previous round.

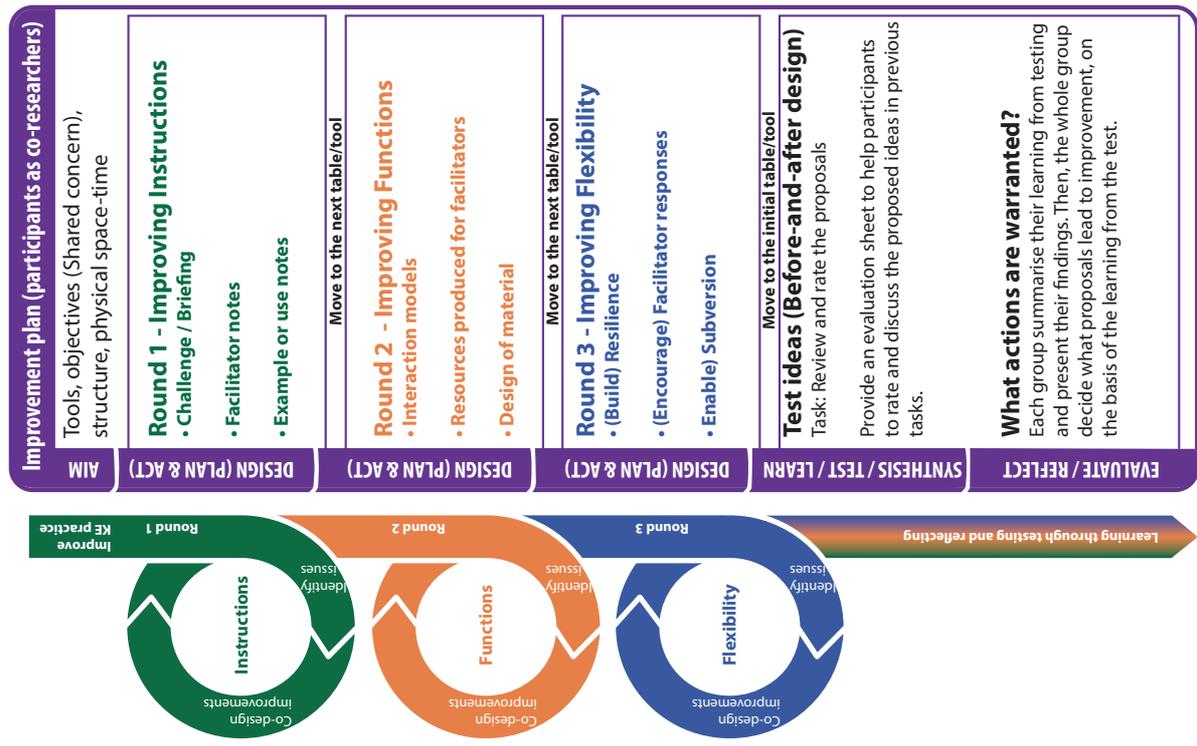
5. Proformas – Participants should be able to look across the proposals to learn through testing proposals. The design of material and the facilitation actions should support the process towards a desired outcome.

Turn over this leaflet to see the insights into the Improvement Matrix layers, dimensions and components

How to run better workshops?

RQ: How Can Tools for Knowledge Exchange be improved?

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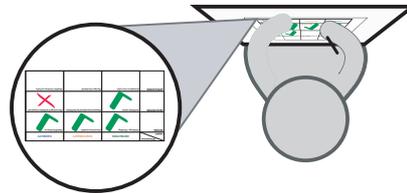
Improvement matrix

Dimensions \ Layers	INSTRUCTION	FUNCTION	FLEXIBILITY
DESIGN	Challenge / Briefing	Interaction models	Appropriation
FACILITATION	Facilitator notes	Resources produced for facilitators	(Encourage) Facilitator responses
APPLICATION	Wording	Design of material	(Enable) Versatility

Appendix R – Redesigned Improvement Matrix A3 handout



Think about the tools you need to design to communicate with groups a particular type of work or knowledge exchange you are going to do.

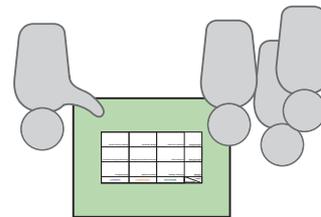


Checklist for the design of tools



Print out the framework on a large format paper and stick it on the wall. Discuss the needs of different audiences using coloured sticky notes.

Populate the framework with information about a series of workshops



Use the framework as a memory aid to teach students on how to create better engagement tools

Teaching aid

Suggestions for use

The improvement matrix framework

How to run better workshops?

The Improvement Matrix is based on a review of the literature on co-design and participatory design practices, and my experience and background in designing and delivering workshops and tools. This framework aims at improving tools for participation in order to make better creative engagement practices and workshops.

The intended audience of this framework are people who work with groups of non-designers, and design researchers specialised in participatory approaches and tool design.

This framework consists of a matrix with nine components that prompts people to think, discuss and improve tools that are based on three overlapping engagement practices (Design, Facilitation, Application) and three dimensions used for improving tools (Instruction, Functionality, Flexibility).

This framework was designed and tested in collaboration with public sector practitioners in Lancashire, and design practitioners and delegates of the Design Research Society (DRS2018) and European Academy of Design (EAD2019) conferences. This framework was developed as part of larger research project called Leapfrog and Rosendy Galabo's PhD research project called Improve It at Lancaster University.



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Working example: Improve It workshop

In this workshop, participants with genuine interest in getting tangible benefits of improved tools work in partnership with the facilitator to identify issues and misunderstandings in the tools according to their practices and suggest improvements, and then discuss which suggestions lead to a better engagement process. Each layer of the framework corresponds to one workshop

Duration
90 - 180 minutes

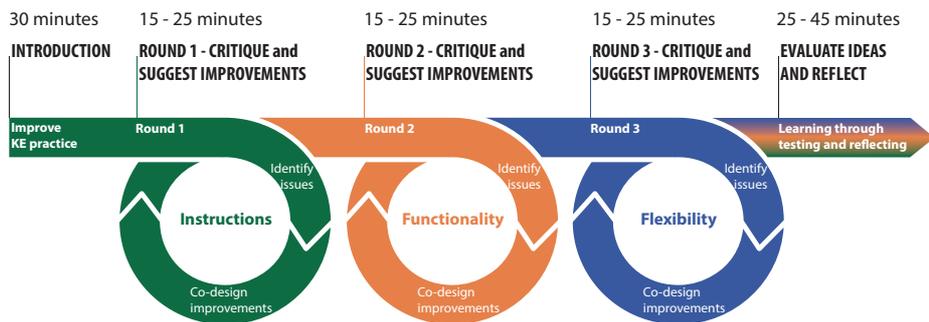
What you will need
Sharpies, scissors, tapes, Post-it notes, Worksheet with questions, and preselected tools

Participants
(6 or more) Designers, community members, partners, engagement practitioners, public sector workers

Seating arrangement
A station composed of a table with 3-2 chairs and designed to enable participants to easily circulate during the workshop,

Workshop instructions

- Remind participants look at the tools, and consider their practice and process in general.
- Encourage participants to scribble and take notes on the tool without being scared of ruining it
- Remember them that the other group should be able to understand your handwriting / notes
- After each round, ask participants to do a rotation and move to the next table until they return to their initial station.
- Remind participants to stay in the same group until the end of the workshop.



Improvement matrix

Dimensions / Layers	INSTRUCTION	FUNCTIONALITY	FLEXIBILITY
DESIGN Improve tools by giving workshop organisers more control over the activity, and flexibility in using and understanding tools	Challenge / Briefing How can you improve the briefing that instructs practitioners on how the tool address engagement challenges?	Interaction models How can you improve the resources to enhance the job of facilitating creative engagement activities?	(Build) Resilience How can you improve the tool to encourage facilitators to deliver creative approaches to achieve the objective of engagement activities?
FACILITATION Improve tools by helping facilitators to design engagement approaches and providing indications of use and practical guidance to participants on how complete tools	Facilitator notes How can you improve the facilitation instructions of the tool?	Resources produced by facilitator How can you improve the resources to enhance the job of facilitating creative engagement activities?	(Encourage) Facilitator responses How can you improve the tool to encourage facilitators to deliver creative approaches to achieve the objective of engagement activities?
APPLICATION Improve tools by tailoring them to suit to your community needs and practice.	Example or use notes How can you improve the wording of the tool to be more appropriate for workshop participants?	Design of material How can you improve the tool visual communication to be more clear and friendly for workshop participants?	(Enable) Contrary activity How can you improve the tool to enable unexpected uses and adaptation by workshop participants?

Turn over this leaflet to see the insights into the Improvement Matrix layers, dimensions and components