

Science, Identity and Belonging

**Engaging through co-design with young people
at a science museum: a qualitative study of process**

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Abstract

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Science, identity and belonging 2016-2022

Engaging through co-design at a science museum: a qualitative study of process.

The *Science, identity and belonging* (SIB) research project aims at shedding light on co-design processes from several perspectives from within the educational department of a science museum. Over a period of four years, an interdisciplinary museum team has collaborated with a group of young people. With the research and temporary exhibition project *FOLK from racial types to DNA sequences (FOLK)* as the pivot point, two phases of co-design workshops have been facilitated. First eight sessions resulting in the digital sound installation *the Sound of FOLK*, followed by a workshop where we collaborated with two partners from phase one arranging a workshop with children in the *FOLK* exhibition. SIB illuminates how a museum can connect with young people outside of school hours and through it disrupt how museums think about their educational role in society. Moreover, co-design gives opportunities for young people to enter into close conversation on topics that are difficult, complex and sensitive, interchanges that can be used in acting as humans in the society.

This practice-based PhD has resulted in three academic papers: One investigates how co-design has an impact on curatorial reflexivity, a second thematizes how co-design can foster engagement in the interaction between museum professionals and youths. The third looks more closely at how knowledge develops and travels from partaking in collaboration of a digital installation into a post-production phase co-facilitating an activity program. A professional paper elaborates on the usage of Future workshop and a podcast discuss how co-design encourage socially engaged practices. The SIB process has highlighted issues around the sharing of museum authority, multivocality, long-term partnerships, mutual learning and experts working along non-experts. It explores how museum development can include external partners in reflexive processes, and how it in turn ensures a process that is rewarding for all partners involved.

In memory of my parents Ingrid and Einar Skåtun,

**With deep gratitude for the love and support of my family Harald Fossberg, Karl
Einar Fossberg, Åse Fylling Riiser, Hanna Karin Fossberg, Sindre Raknes,
Ingeborg Skåtun, Iza Wachter, Karin Fossberg, Sverre Riiser Fossberg, Signe
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List of abbreviations

FW – Future Workshop

NTM – Norsk Teknisk Museum (Norwegian Museum of Science and Technology)

IKM – Interkulturelt Museum (Intercultural Museum)

HCI – Human Computer Interaction

UiO – University of Oslo

PD – Participatory Design

ICT – Information and Communications Technology

UI – User Interface

FOLK – FOLK from racial types to DNA sequences

SIB - Science, Identity and Belonging

DKS – Den kulturelle skolesekken (the Cultural Rugsack)

OSCD – Organisation for Economic Co-operation and Development, Strategic mission on future education and skills

EU – European Union

CRISTIN – Current Research Information System In Norway

LAB – space for cross-departmental and external collaboration at NTM

GDPR – General Data Protection Regulation, EU regulations

1. Introduction: Science, Identity and Belonging (SIB)

The co-design research project that is the focus of this PhD thesis is called *Science, Identity and Belonging (SIB)*. From the autumn of 2016 until spring 2020, I collaborated in the context of SIB with various people, including youths from 16 to 19 years, a cross-professional team at the Norsk Teknisk Museum (Norwegian Museum of Science and Technology in English, hereafter abbreviated as NTM) in Oslo, an academic researcher, university students and younger children aged 10-13. All in all, 22 people have been involved in this project. SIB was closely connected to the temporary exhibition *FOLK*¹: *from racial types to DNA sequences (FOLK)*, which was on display at NTM from March 2018 until December 2019. The first series of SIB's co-design workshops led to the production of a sound-based installation, *The Sound of FOLK* (hereafter *The Sound*), which was part of the *FOLK* exhibition. The second series of co-design workshops of SIB took place a year later, from December 2018 to March 2019, and related to the design of a learning programme for *FOLK*. My research suggests that co-design, gives young people new and different opportunities to act together with the museum in exploration of socially relevant themes that are difficult, complex, and sensitive. Central to this thesis is the collaboration with young people from Grorud Youth Council². These partners were members of the youth advisory board of the Grorud borough in Oslo, the capital of Norway. The council consisted of 11 young members; nine of these participated in some SIB activities, half of them participated in most activities, and two participated in all the workshops. In addition to these, the group was expanded with two members who brought in a friend each. Grorud is a suburban area, a multi-cultural district that is situated approximately eight kilometres from the NTM.

I led the SIB co-design project in my professional role as a museum pedagogue at the NTM. This work has formed the basis of my practice-based PhD research. I have been

¹“The use of the word “FOLK” in the exhibition title reflected various curatorial considerations. The word itself has rather neutral connotations in Norway as in its everyday use refers to “people”. However, in the context of anthropological race science that the exhibition addressed, it pointed to connections between such research and the volkisch or Aryan/Nordic movement” From notes in the paper *Design anthropological approaches in collaborative museum curation*, (Stuedahl et al., 2021).

² To have a seat on the board, one must be elected as a school representative or a youth club in Grorud; <https://www.oslo.kommune.no/bydeler/bydel-grorud/politikk-og-politiske-moter/grorud-ungdomsrad/#gref>, date accessed, 08 October 2021.

responsible for planning and arranging the workshops, including everything from recruitment, timekeeping, reminders and food orders to activity planning and fee payments as well as the establishment of a meeting point on Facebook. I have juggled the task of being both a researcher and the responsible organizer. In the summary I have made an outline of the whole research program, examining more closely the writings of academics and museum professionals. I have also provided a description of my museum pedagogical experiences, as well as a detailed review of the case, ending with a discussion and concluding thoughts. Furthermore, this practice-based PhD project has resulted in three academic papers and one professional publication as well as a podcast bringing the collaborative actors together in a conversation about our common experiences. As the SIB has been a collaborative exploration bringing together a museum team cooperating with a group of young people, I will use the term *we*, when it is a joint reflection and *I* in the parts where I am doing my own reflections on this experience. The latter is more prevalent in the summary analysis, as I at the point of writing this part I have had the opportunity to look at the material with some distance in time and subsequently working on my own.



Figure 1 The Norwegian Museum of Science and Technology situated by the river Akerselva close to Maridalsvannet, the city source of drinking water, Oslo Norway, copyright: Lars Opstad (2020) printed

1.1 Research Context: The Norwegian Museum of Science and Technology (NTM)

The NTM is located outside the city center in Oslo close to the outlet of the river, which carries the history of Norwegian industrialisation and the source of power. The NTM has a long tradition of using objects and exhibitions as its core when facilitating for engagement and learning. From early 2000 the NTM has included the National Medical Museum, which was responsible for the *FOLK* exhibition. In 2014, the Norwegian Telecom Museum, where I previously worked as head of education, was incorporated within the NTM. NTM opened its first exhibition in the basement of the Viking Ship Museum in Oslo in 1932. However, the initiative was established already in 1914, influenced by the Deutsche Museum in Munich and the Science Museum in London, both of which had opened in the early 1900s. Norway had gained its independence in 1905 after four hundred years of Danish and Swedish rule. In line with other museums established before and after independence, the NTM focused on building the country's national identity, as a monument of technology and engineering with all its possibilities. Keeping in mind that the Norwegian national identity is more closely connected to Norway's folk-culture than its industrial heritage, it took time for the NTM to have its own building, this happened first in 1959 (Andersen and Hamran, 2014a). Like in many other countries in Europe, a bourgeoisie emerged in the 20th century and several patriotic national museums were established as part of the new civic public in a new society (Hylland and Mangset, 2017).

The first decades of the museum's history saw a slow process of demarcation between the collections and the exhibitions; objects on display had explanatory labels attached (Ruud, 2012). From the beginning, the NTM emphasised its dual role as a historical museum exploring science as cultural history, trying to connect technology with culture in the public imagination. At the same time, the museum paid attention to contemporary issues related to science, actively engaging in the education of artisans and engineers in a practical way (Andersen and Hamran, 2014a). In recent decades, the NTM has also developed exhibitions with a focus on controversial subjects, such as the *Climate X* exhibition where visitors had to walk in wellington boots on a floor filled with water up to the ankles to simulate the experience of climate change (2007); and *Engineers of*

Death (2010) an exhibit that problematised the Norwegian engineering skills in the making of the gas chambers during the Second World War. Since 2012, the NTM has had a vision of being the most dialogue-oriented, bold and visible museum in Norway. When Norway celebrated 200 years of its constitution in 2014, and the NTM its 100-year anniversary, the museum created the temporary exhibition *TING, from Technology to Democracy* (*TING*). A hundred objects in the span from a waffle iron and phone booth to weapons and robot seal, taken out from the museum collections were on display, all of which had played a role in exercising democracy. When entering the exhibition, the quote ‘Technology is neither good nor bad; nor is it neutral’ by Melvin Kranzberg met visitors at the entrance. An expression that in many aspects underpins the museum’s dialogical approach to materiality and their multiple relations (Treimo, 2020). The NTM had a new director in 2018, who fully endorsed the museum’s goal of fostering dialogue in Norway in bold and visible ways, which continues to influence how the museum is managed. Within this context of promoting ideas to tackle controversial issues, the *FOLK* exhibition, and its related programming, including SIB, was developed, and implemented. The exhibition addressed how early race science has an impact on how we understand human biological differences today. It took a close look at the interaction between science, society and culture. In section 1.5 the SIB co-design process will be contextualized within the *FOLK* exhibition and research program. The controversies the exhibition brings forward will be further elaborated on and examined in the context of theory in a thorough case description in my discussion chapter.

The SIB’s active co-design approach that focuses on the social issues that surround science and its applications, can be seen as precursor to current Norwegian cultural policy. In the spring of 2021, The Norwegian Parliament put forward for consideration two white papers that reinforce NTM’s mission and are relevant to my discussion of SIB.³ The Minister of Culture presented *White Paper 23: Museum in Society: Trust, things and time*, which foregrounds collaboration, listening, active dialogue and reaching new user groups, both in terms of methods and content. Regardless of

³ In March 2021 the White Paper number 23 was launched: Museum in society, Trust, things and time (2020 – 2021) <https://www.regjeringen.no/no/dokumenter/meld.-st.-23-20202021/id2840027/>, and the White paper number. 18 (2020–2021): Experience, create, share - Art and culture for, with and by children and young people. <https://www.regjeringen.no/no/dokumenter/meld.-st.-18-20202021/id2839455/> date accessed, 12 October 2021.

background and upbringing, the access to culture and art is essential, this shall influence the planning of the cultural field of children and young people. This is prominent in *White Paper 18: Experience, create, share - Art and culture for, with and by children and young people*, which promotes an understanding of young cultural users as recipients, participants, and actors, emphasising that young people and children shall have the right to influence the politics of art and culture.

Norway as a country in Europe is influenced by international trends, which is evidenced in the aforementioned white papers as well as the latest national curriculum⁴.

Comparisons to international trends that are prominent in the White papers 23 and 18 as well as the new curriculum is a participatory shift, with words like create, share, trust, identity, cultural diversity, and co-determination in the titles and introductory sentences of these Norwegian policy documents. An important premise for museums as providers of learning programmes directed towards the school sector has been the Cultural Rucksack programme *Den Kulturelle Skolesekken* in Norwegian, abbreviated DKS⁵, funded by lottery funds equivalent to the National Lottery Community Fund in the UK. The DKS was established in 2001 as a government body offering cultural experiences for children and has expanded over the years to capture all students up to 18 years of age. It is governed locally and captures several cultural expressions of which the cultural heritage is the most relevant for a museum like the NTM to act within. My earlier experience as a board member of DKS working in tandem with teachers nominating programmes in the category Cultural Heritage at Oslo's DKS chapter is that DKS emphasised programmes that facilitated for participation and student activities. Furthermore, DKS has at its best shaped how museums design their learning activities and played a significant role in inspiring a more complex scaffolding of learning programmes (Brenna and de Ridder, 2018).

The mindset reflected in these plans is closely related to prevalent pedagogical trends in understanding a young person's learning in society. Such trends include the development of twenty-first-century skills and key competencies developed by OECD⁶

⁴ In August 2020 the Knowledge Promotion Reform replaced the old curriculum; <https://www.udir.no/in-english/curricula-in-english/> date accessed, 12 October 2021.

⁵ DKS Activity report from 2020: <https://opplev.kulturtanken.no/artikler/dks-arsrapport-2020/> date accessed, 12 October 2021.

⁶ Organisation for Economic Co-operation and Development, *Strategic mission on future education and skills*: <https://www.oecd.org/education/future-of-education-brochure.pdf>, date accessed 27 January 2021.

and the EU, which have been inspired by the UN's sustainability goals, and centralise principles of soft skills, like communication, self-motivation, problem solving, and teamwork. In the Norwegian Curriculum, these competencies are reflected in the new interdisciplinary subject public health and life skills⁷.

However, in the Norwegian museum context there has been little research on collaborative processes where youths play a significant role. A search in the database CRISTIN⁸ on 'Museum og ungdom'⁹ yields 19 results, while 'museum history' gives 8 661 hits. This is not to undermine the great commitment and zeal within museums in Norway to reach young people. Recently this was shown in 'Young Critics'¹⁰ a publication in which several museum pedagogues involve young people in developing or discussing museum programmes. One notable project is from the Eidsvoll 1814 where the Norwegian Constitution was written in 1814, now a museum with an emphasis on democracy. In 2017 they collaborated with a local high school and arranged for a three-day 'take over'¹¹. In a report from 2019, Brita Brenna and Therese De Ridder (2018) examined the history of the collaboration between schools and museums and considered the research in the field of museum pedagogy. They highlighted five projects from 1977 to 2007 that have contributed to drive their reflection further, studies that have been carried out on young people's relationship with the museum.

Furthermore, there is no research that captures how knowledge materialises in the collaborative endeavour between museums professionals and young people in co-design. In this area, SIB elaborates on how to involve young people in exhibition and

⁷ The new cross disciplinary subject in school: <https://www.udir.no/lk20/overordnet-del/prinsipper-for-laring-utvikling-og-danning/tverrfaglige-temaer/folkehelse-og-livsmestring/?lang=nob>, date accessed, 28 April 2022.

⁸ Searched the Norwegian term "Museum og ungdom" as well as the English 'Museum and youth'. Current Research Information System in Norway: <https://www.cristin.no/english/> date accessed 12 October 2021.

⁹ Ungdom translated to English would be youth.

¹⁰ Which impact does a 100 years old house have on 14 year olds?, Collective mental maps as place criticism and participation in exhibition work, The museum's balancing act: Social responsibility, power and openness to the public, Young critique of democracy center for young people <https://museumsforbundet.no/unge-kritikere/> / date accessed 12 October 2021.

¹¹ A student group of 90 took control of the museum for a duration of three days: <https://eidsvoll1814.no/hva-er-ta-over>, date accessed 12 October 2021.

programme design at a science museum and how co-design as a process can foster engagement and contribute to a reciprocal learning ecology.

In the following, I present a timeline for the whole process capturing the research program prior to the development of the FOLK exhibition, followed by the co-design meetings points and its division into es.

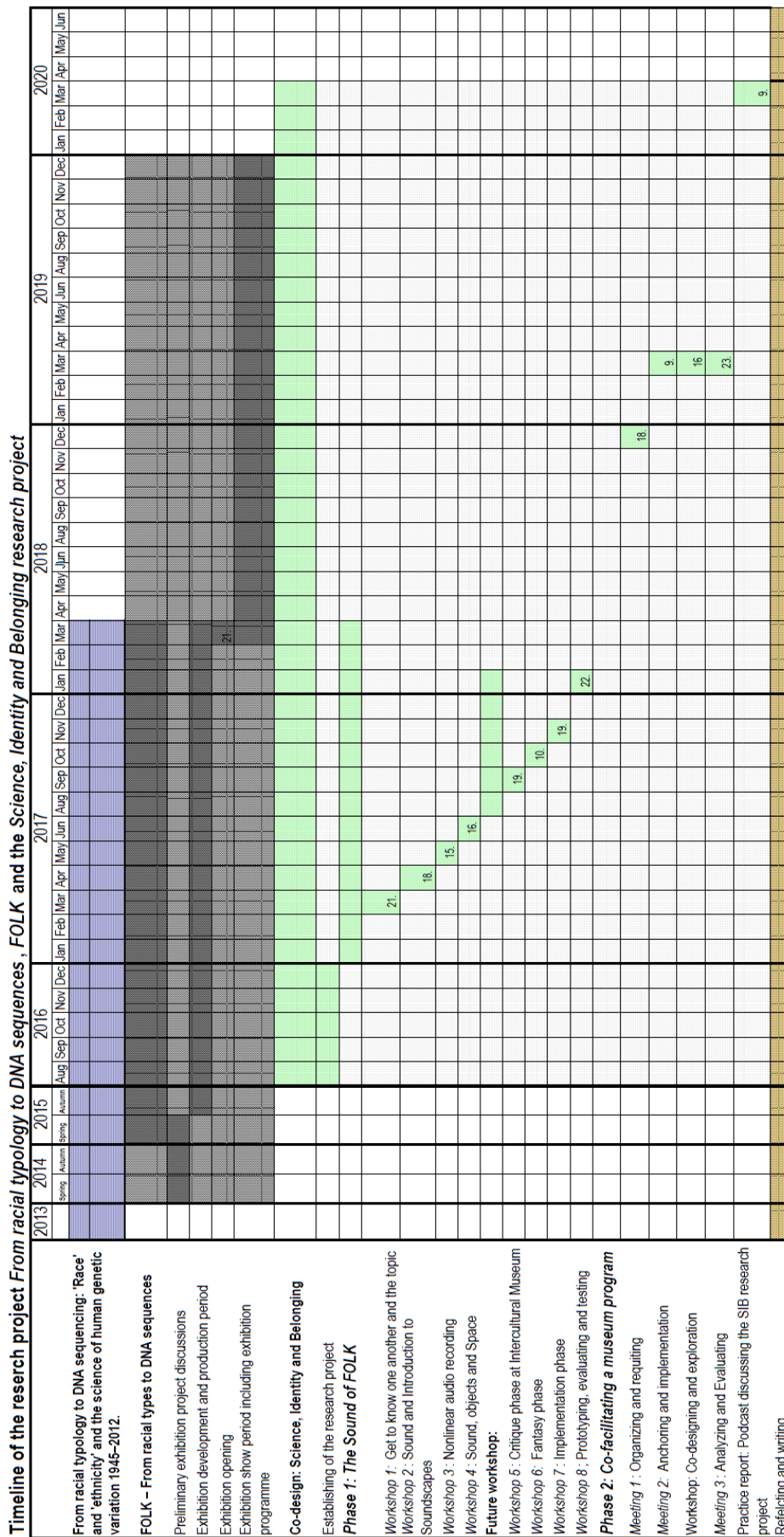


Figure 2 Timeline of SIB included the science history research program, in purple the timeframes of the research program, in grey the development and lifetime of the FOLK exhibition, in green the SIB co-design process, with the events marked by date of which month they happened, all through the process the material has been reflected on and written about. ill. Torhild Skåtun

1.2 Methodological context: a co-design approach

The museum is more than just a site to exhibit objects, it can be a space for staff to co-produce knowledge together with multiple and varied users and partners. Of particular interest to me in such knowledge co-production endeavours, is the role of co-design. Co-design is a collaborative approach to design, towards an unknown design output that will be shaped by the opportunities the situation gives (Sandholdt and Achiam, 2018; Smith and Iversen, 2014; Stuedahl, 2017). Co-design is a collaborative design process related to the tradition of Participatory Design (PD), a process that supports mutual learning for all participants, though with an emphasis on the designer understanding user needs (Bratteteig et al., 2013; Simonsen and Robertson, 2012). Co-design differs from PD through a stronger focus on the collaborative interactions that unfold (Ciolfi et al., 2016a). Keeping in mind that design as a concept is always re-design and the point of departure is something that already exists in the world (Latour in Binder et al., 2015), I understand co-design as departing from the people involved and their knowledge and experiences. Design principle places the user at the core and allows for actors to deal with complexity in a process that open up for differentiation (Durose and Richardson, 2015).

In the case of SIB, the pre-existing component was the aim to create a cultural-historical exhibition within some given framework and with an objective that the associated activity in itself should facilitate for co-creation. Exhibitions and activities are strictly speaking what a science museum consists of in meeting with the visitor. Co-design facilitates a process of investigating together, quite similar to a collaborative enquiry (Dindler et al., 2010). In co-design projects, we strive to equalise the participants' role, viewing everyone as experts in their own life and giving the collaborative partners a stronger say (Smith and Iversen, 2014; Stuedahl and Skåtun, 2018).

In the past two decades, the participatory shift in museological practices has been much explored within scholarly communities (Akama and Light, 2018a; Bunning et al., 2015a; Knudsen, 2016a; Macdonald, 2007a; Smith and Iversen, 2014a; Stuedahl, 2018; Vavoula and Mason, 2017) as well as among museum professionals (Birchall, 2017a; Høholt, 2017; Simon, 2010a). One can call it a participatory paradigm shift defining museum visitors as collaborators (Holdgaard and Klasttrup, 2014). In the context of

science museums and science centres, some co-design projects have been carried out. Notable examples are Catharina Sandholdt's (2018) work with family groups and a museum design team to co-design a science centre installation focusing on health issues, and Ingrid Eikeland's (2020) work with science educators in co-designing a controversy-based learning programme. These are research projects that set the scene at a Scandinavian science centre, close to my experience at a science museum in the same region of the world. They look at processes and shed light on interactions and collaborations that take place in the outer canon of what is considered ordinary learning programmes.

Methodologically, these projects both explore collaborative endeavours where the researchers themselves play a significant part in the dialogues and actions, both resting in the tradition of Participatory Action Research and Participatory Design. Regardless of what type of museum one has as a starting point, there are few who have my inside perspective, as organiser, facilitator, museum educator in combination with having a voice in the exhibition team. This has made it possible for me to govern the SIB project with care and enthusiasm from within, and my presence has made it difficult for the museum, or as in this specific case the exhibition team of *FOLK*, to opt out. At times when ambiguities around the project have arisen, I have had the possibility to detect the uncertainties and have taken an active part in the internal discussion. For example, when one of the lead curators questioned the usage of digital sound as a complementary activity to the *FOLK* exhibition, I arranged for a meeting with members of the SIB team for a discussion on museum experiences. My knowledge of the museum's organisation has also enabled me to ask the right people for help, be it administrative services or building support on the digital installations. At the same time, involving colleagues from other departments in SIB (e.g. the involvement of my colleague Tobias, a museum technician) expanded the ownership of the project to encompass more professions and departments within NTM.

As discussed previously, the design of this research rests on Participatory Action Research methodology, and my main source of data has been my own reflexive process, which I kept active through writing research logs and sharing these with my fellow researchers. My and my co-researchers' research log and notes fed into our discussions, which in turn strengthened my understanding of how the co-design process unfolded (See appendix 11 for a sample of how research logs capture reflections on the process).

The research logs and workshop recordings also played an important role in enabling me to contextualise my reflections on our co-design experiences: while the co-design experience was part of me, the captured data made the experience external, something I could look at as another account of the co-design events and which framed my reflections. Thus my approach to data analysis is, in a sense, autoethnographic as well as collaborative autoethnographic (Lapadat, 2017), as I captured (graph) my personal experience (auto) (in memory, in writing, in video) and tried to understand it in light of the cultural experience (ethno) that was the co-design (Ellis et al., 2011). Significantly, the collaborative format of the research design, framed reflective conversations between the research team as well as with the young people. In practical terms, my reflective process *was* the data analysis, and involved my conferring the transcripts, recordings, my and Tobias's research logs, interviews, and participants notes. Combined, these various entries to the data have driven my thoughts forward. Keeping in mind that this self-narrative process has its ethical challenges concerning representation and taking the role of speaking on behalf of others, therefore an attentive reading and active listening has been essential.

1.3 Researcher Context: A museum pedagogue

The Norwegian FOLK Museum¹² in Oslo was the first Norwegian museum to hire an educator in 1930 or to use the Norwegian term, a museum pedagogue. The National Gallery and NTM followed suit in 1947. Among these new museum professionals, the classic guided tour of the museum did not rank high. The pedagogues were at that time inspired by contemporary pedagogical methods like activity-based learning (Brenna and de Ridder, 2018). In some ways, traces of such activity-based learning perspectives can be found in co-design processes today, when participants discuss and reflect on their actions.

I qualified as a teacher, trained in the pedagogical mindsets of learning by doing and reflection (Dewey, 2005a; Winstanley, 2018a). Prior to entering the museum sector, I was a primary school teacher for four years, during which time I often supervised trainee teachers in my classroom. In 1997 I joined the Norwegian Telecom Museum to

¹² Norwegian Folk museum is an open- air cultural historic museum with 160 buildings, focusing on the time from 1500 to present time. Established in 1894. <https://norskfolkemuseum.no/en>. date accessed 12 October 2021.

work as a pedagogue on its main exhibition. Since 2014, when the museum was incorporated within the NTM, I have been a NTM pedagogue. Entering the field of museum pedagogy, I brought with me a reflexive approach to pedagogy and an understanding of learning and young people that was in many ways different from that which was prevalent within museums in the late nineties. The term for museum education in Norwegian is *formidling* and directly translates into English as ‘dissemination’; this reveals the historically prevailing attitude in the Norwegian museum sector that equated educational outreach with the concept of transmission of knowledge. However, within the contemporary Norwegian museum context, *formidling* captures a whole range of activities, spanning from making exhibitions, developing educational programmes and facilitating activities. My own *formidling* within the NTM has at times been experimental and at others quite traditional, from workshop-based activities to guided tours on the story of the Industrial revolution – the latter, a tour I often gave myself. This spectrum of programs characterises the museum offer today, as different ways of communicating science continue to exist parallel to one another (Alan Irvin in Davies and Horst, 2016 p. 225).

My main professional interest and focus has been how museums can support learning and play an active part in people’s lives through exhibitions and programmes. Even though my primary focus has been on creating programmes for students of all ages, I have always been interested in museums as spaces for interaction across generations, as places of sharing memories, and as places that adapt and transform to suit their audiences. In my long museum pedagogue career, I have developed a variety of learning activities and programmes, many in collaboration with external partners, which facilitate collaboration and sharing. Some were linked to the university sector, jointly designing learning programmes that elaborated topics in the curriculum, whereas others were developed in connection with temporary exhibitions. With my teacher background, I have always focused on scaffolding learning activities that enabled the participants to act, collaborate and reflect.

1.3.1 Pedagogical positioning

The co-design project that I will describe, elaborate, discuss, and analyse in this doctoral thesis should be read in the context of my own pedagogical interests and positioning, as well as the context of the auspicious messaging from the government discussed in the previous section, itself the result of a mindset reflected in the Universal Declaration of

Human Rights that emphasises the right to be heard as well as for museums to be a more active part of a broader collective knowledge machinery. Two programmes that I led before this PhD stand out as depicting the development within the museum field in Norway over the last two decades and my place within this: *The museum in prison* project (Skåtun, 2014) where museum pedagogues from three Oslo museums (including NTM) adapted their learning programmes for Oslo prison inmates; and the *Meeting Memories* project (Folge et al., 2013) which explored museums as places for coequal dialogue for people affected by dementia. Both programmes focused on how to facilitate encounters between objects and people that hold potential to build capacity for the individual participant. These initiatives reflect NTM's ambition (which through these projects I, too, had a role in shaping) to connect with groups that are hard to reach with a belief that cultural encounters can have an impact on people and society.

Turning my research interests towards my own professional practice for the PhD has necessarily meant that my perspective on this research is a museum 'insider's perspective'. The research itself stems from my desire to better understand how my practice has evolved over two decades and what its evolution means for how my museum engages with its audiences. Being an 'insider researcher' means that this project is inevitably influenced by the norms and culture of my organisation's practice (Serpa, 2016). These I have internalised and perform daily. For example, I know the room for maneuver when establishing new collaborations externally as well as internally as I recently initiated an involvement of museum explainers in the development of a digital installation. Not all of my biases are a result of my organisation's culture. My position as an engaged museum professional with a strong belief in the potential of museums to change lives¹³ may have also coloured my reflections. This propensity and belief in an inclusive and equitable museum also underpin my focus on co-design.

My PhD project is the beneficiary of NTM's generous funding and support: the museum has funded the whole of SIB research programme (including workshop expenses and co-designer remuneration), paid my tuition fees at the School of Museum Studies, and allowed me to use 50% of my worktime to conduct my doctoral research. Furthermore,

¹³ Participation at the Museum association conference in 2014 and 2017: <https://www.museumsassociation.org/campaigns/museums-change-lives/#> . date accessed 12 October 2021.

I have been given the opportunity to travel to Leicester regularly, having had all my expenses covered by the museum. While such practical support may have inhibited my ability to be critical of museum practices and understandings (O'Neill, 2006), including my own; it has also positioned the SIB project at the core of the NTMs research programmes. This investment in my research has empowered me to find the time and space to explore co-design practices within the science museum. Ongoing conversation with my colleagues from different departments with varying degrees of knowledge of my field, has challenged and strengthened my reflections. The conversations that have ensued from my research have opened up a meta-perspective on my own practice, given me an opportunity to zoom out of interactions and analyse them in a larger perspective. These different inputs have sharpened my understanding of what codesign processes can entail in the form of capacity building at both individual and group levels. Our dialogues have contributed to an increased vocabulary on participatory practices and, in a broader sense, audience interactions. Among other benefits, this has been helpful for the museum during various processes of writing applications for funding as well as for internal planning work. The outcome thus is a deeper understanding of my professional practice that leads to its improvement, and this makes the NTM a beneficiary of the project in return.

Throughout the thesis I will pay attention to the language that I use, which I want to be inclusive and understandable across professional backgrounds and departments. This requires a capability to present opinions, views and experiences in a language that is understandable from many different perspectives. To borrow a concept that I will discuss later, I intend my thesis to function as a 'boundary object' (Star 2010) that can facilitate dialogues on museum co-design practices.

Research questions

The research questions are articulated with the procedural character of co-design in mind, which involves translations, negotiations, adjustments, and mutual learning. As will be elaborated in the literature review, there has been a movement in the world of museums during the last decades towards a more human-centred approach, a shift that has been put forward by several scholars and museum professionals (Bennett, 2013a; Weil, 2002). This mindset has been nourished by a constructivist view of knowledge development; as a back and forth between old and new insights, skills and understandings, during situated encounters (cf. Falk and Dierking, 2000; Hein, 2002; Hooper-Greenhill, 1999). Against this backdrop, co-design focuses on blurring the distinctions between the actors in the collaborative endeavour (Ciolfi et al., 2016a). A lot has been published on participatory practices within museums over the last decade, discussing among other topics plurality, partnership, the difference between collaboration and consultation, digital interaction, and outsiders versus insiders (Bunning et al., 2015a; Holdgaard and Stuedahl, 2021; Simon, 2016a; Smith and Iversen, 2014a; Stuedahl et al., 2021a).

RQ 1 : How does co-design in a science museum impact, and in turn is impacted by, knowledge creation processes at an individual and an organisational level?

Viewing learning, and the opposite un-learning, as something that emerges through collaborative practices is at the core of this research question. Also in focus are the tools and techniques that support the continuous dialogues, negotiations and translations that are part of a participatory process (Simonsen and Robertson, 2012). Sharon Macdonald (2007) analyses the movement from *effect* to *affect* to capture perspectives around emotions and presence and argues that museums may open up possibilities for users to bring in perspectives and for a reframing of the institution's collections, programmes and exhibitions. Participatory practices do not detract from the professionalism of curators and educators. They just alter the way an expert connects with the communities they are part of and call for museums to share and expand professional insights with other people (Achiam and Marandino, 2014; Kreps, 2011; McSweeney, 2016). Helen Graham (2016) posits that the role of the curator in participatory practices can be understood as a continuous process of stabilisation, pluralisation, and re-stabilisation of new representatives. This change of perspective is necessary to prepare the museum as a space for dialogical interactions whereby they can become places where democracy is

exercised (Biesta, 2015; Lundgaard and Jensen, 2014; Modest, 2013a; Sandholdt, 2016; Smith and Iversen, 2014a; Sørensen, 2021). Museums can also choose to be activist or controversial by shedding light on complex socially relevant topics (Sandell, 2016). Throughout history, museums have had a goal of helping to educate and form a population (Barrett, 2012; Feinstein and Meshoulam, 2014a; O'Neill and Hooper, 2019a). Co-design is closely connected to participatory design, aiming at blurring the boundaries between different stakeholders, as well as taking into consideration the difficulties in properly understanding the user's needs, values, cultural and societal assumptions (Ciolfi et al., 2015; Mygind et al., 2015). The process allows focus on a topic over time through which insights and knowledge travel over contexts. How knowledge is constructed, negotiated, and shared within these collaborative, institutional and community contexts, is therefore an important question.

RQ 2: How do co-design processes transform the museum into a space for dialogical interactions between experts and non-experts?

Science museums are accustomed to being expected to provide clear answers to relatively complex questions (Dillon, 2017; Rock et al., 2018a; Yaneva et al., 2009a). The co-design process expands the space for discussions to allow scientific nuance and uncertainty to be understood. By encouraging conversation across the traditional expert and non-expert demarcation and having the shape of a joint investigation (Brown, 2011; Dindler and Iversen, 2014a), co-design questions who the experts are and on what, and in many aspects fosters dialogues along several axes by providing opportunity to talk about experiences and analyse human dealings. Co-design processes facilitate for giving a voice to those in society that do not have a place to be heard due to age or other hindrances, (Druin and Kolko, 2017; Witcomb, 2013). For the dialogues to flourish and collaboration to happen, it is important to focus on the facilitation of safe spaces. In the sense of rooting the interactions in one's own perceptions, co-design processes foster an environment that allows for participants to take risks (Katrikh, 2018). This can arguably connect closely to the co-design methodological approach as a strategy that is close to practice in museums. Educational programmes in museums have dialogue-supporting elements (Bernhardt et al., 2012; Simon, 2016a), and pedagogues are in many ways prepared to handle the conversations that unfold during a co-design process. However, in collaborative interventions it is an exercise in letting the dialogues be

directionless and at the same time scaffolding¹⁴ the interactions towards a concrete outcome – albeit an as yet unknown one (Smith and Iversen, 2014a). There are several lines of relationships when museum professionals work alongside a group of young people. These can disrupt the experts and non-experts ‘conversations, and prepare for mutual learning and co-realization (Bratteteig et al., 2013; T. Messenbrink, 2018; Simonsen and Robertson, 2012). In the SIB project, we were all experts in our own lives, including our young partners as students and council representatives (Stuedahl and Skåtun, 2018a). However, it can be difficult for the museum to transcend the role of teacher, not only because this is what we have traditionally and habitually been doing, but also because it is what many young people expect when entering the museum (Bell et al., 2009). Therefore, the second research question interrogates the flattening of the hierarchy of relationships between experts and non-experts through co-design.

RQ 3: How can co-design affect the way that a science museum understands itself as an active agent in young people’s learning and engagement ecology?

Engagement in collaborative practices in exhibition design can be understood as an exploration of a topic, issue or concern together with others, in contrast to visitor evaluation and testing that is often a one-way activity. In many contexts, user-centred design is based more on this latter kind of testing a product in the different phases of development more than involving the users to have an active role in the development process itself (Guha et al., 2005; Riikonen et al., 2018). In this way I would argue that co-designing and co-research hold potential to find new questions in museum development to problems that we are still not able to articulate (Bannon and Ehn, 2012; Estalella and Sánchez-Criado, 2015). An important aspect of co-design is to consider how it could be a rewarding process for everyone involved (Lynch, 2011; Modest, 2013; Tzibazi, 2013). The longevity of a co-design process in combination with a joint exploration encourages the creation of a community of practice and cooperation that crosses contexts of learning (Drotner and Erstad, 2014). With the capacity to nurture connections between spaces of learning and engagement, SIB allowed the partners to share experiences and knowledge from school as well as from their everyday life as a significant contribution to the ongoing conversation (Galani et al., 2019b; Stuedahl and

¹⁴ The term scaffold was introduced in the 70ties as a way to describe a situation where adults support children during acts of exploring, as a way of moderating choices as well as give structure (Wood et al., 1976).

Skåtun, 2018a). Undoubtedly, SIB learnings will have in turn fed into ongoing learning in these other parts of co-designers' lives. Understanding knowledge as both a process and as a performance, the results of a co-designed project can be grasped as an ongoing activity in relation to the surrounding landscape of people and things (cf. Falk and Dierking, 2000; Hein, 2002a; Hooper-Greenhill, 1999a). The third research question therefore takes a step back to locate co-design within the larger landscape of the partners' learning encounters and explore how connecting and cultivating learning across experiences can be maneuvered within a co-design process, especially the time that is needed for a joint exploration and understanding to 'grow' in partners' lives.

1.4 SIB Context: *FOLK* from racial types to DNA sequencing, a research and exhibition project

In the Norwegian public debate, there is a lack of presence of the term 'race' (Kyllingstad, 2017). As in other European countries, race is a nebulous concept, which often hides behind 'ethnicity' (Balkenhol and Schramm, 2019). In *FOLK*¹⁵ the history of race science is explored with the vision of building an inclusive arena that is open for the public to discuss this field.

¹⁵ *FOLK* won the British Society for the History of Science Great Exhibitions Prize 2018 as 'an outstanding example of how history and historical artefacts can be used to engage with present-day concerns'.
<https://www.bsbs.org.uk/winners-announced-bsbs-great-exhibitions-prize-2018> date accessed 12 October 2021.



Figure 3: View of the FOLK exhibition. The cabinet of curiosities in the foreground displays how people and cultures have been stereotyped, romanticised, and appraised historically and in the present. An archive can be seen in the background, where it was possible to take a closer look at people, institutions, and scientific practices in research on biological differences from 1800 until today¹⁶. Copyright Asa Maria Mikkelsen (2018), printed with permission.

The making of the *FOLK* exhibition rested on the History of Science research programme *From racial typology to DNA sequences, 'race' and 'ethnicity' and science of human genetic variation 1945-2012*¹⁷ (Lefkaditou and Kyllingstad, 2015) The project was funded by the Norwegian Research Council and focused on how contemporary genome research raises ethical and political questions about genetic information in today's society. The aim was to illuminate the interaction between scientific knowledge and society and how they affect each other. The development of the *FOLK* exhibition started in the autumn of 2016, and I participated in the first meeting in September. There was a shared leadership of the *FOLK*-project between the two curators Ageliki Lefkaditou and Jon Kyllingstad. They are both historians of science and were, respectively, a post-doctoral researcher and the head of the *From Racial typology to*

¹⁶ Summary of the *FOLK* <https://www.tekniskmuseum.no/folk/utstillingen/sammendrag> date accessed 12 October 2021.

¹⁷ The overall aim of the research project was to investigate the interactions between societal and scientific processes in the establishment of concepts of 'race' and 'ethnicity' in physical anthropology and human population genetics from 1945 to 2012. <https://www.tekniskmuseum.no/folk/research/about-the-project> date accessed 12 October 2021.

DNA sequences project. They had no experience in exhibition making and were very open about their lack of experience. Therefore, they sought support from more experienced curators as well as from representatives from the learning and communication department. As is usual in exhibition making, a cross-disciplinary team was put together where I was responsible for designing the learning programme, and others were responsible for arranging a series of public events. I also took part in arranging public meetings and workshops with external scholars. A process driven by the principles of equality and care were pursued, keeping in mind that these were collaborative sessions without being blind to how power relations are distorted because of the museum's institutional standing (Stuedahl et al., 2021). Besides developing a learning programme, I brought with me an aspiration to develop and conduct my PhD research in connection with the development of the *FOLK* exhibition.

In 2016, the NTM established the LAB area (Treimo, 2019), a space for cross-departmental, internal collaboration as well as collaboration with a range of external community partners, from artists to young people. The LAB features a round table with space for up to 16 people where the *FOLK* group had a conversation about drawings of the exhibition area that were projected on a screen (Figure 6). Most of the SIB workshops took place in the LAB, making use of this facility that aims to foster collaboration and co-creation by inviting participants to co-design 'behind the scenes' of the museum. SIB being a parallel endeavour to the *FOLK* exhibition development, most of the meetings and workshops took place around the same table whether they were internal or with external partners.



Figure 4: The FOLK team consisting of curators, museum pedagogues, conservators, communication workers, technicians, and programme developers, here listening to the external exhibition designer presenting the exhibition concept. Copyright: Ageliki Lefkadiou (2016), printed with permission.

The FOLK exhibition as described and outlined in the pamphlet¹⁸ was placed in a shielded temporary exhibition space. The introductory zone was drawn out to the entry passage at NTM exhibition areas, as is shown in the photograph in Figure 5. The Sound of FOLK installation was placed 10 meters to the left of the location shown in the photograph, while the exhibition started to the right. The pamphlet offers a thorough presentation of the FOLK exhibition, described in an exhibition map, with selected

¹⁸ <https://www.tekniskmuseum.no/dokumentlager/utstillingene/folk/179-pamphlet-folk/file>, date accessed, 6th of October 2022.

themes highlighted and including an explanation of the structure of the exhibition area.



Figure 5, FOLK entrance, Copyright Asa Maria Mikkelsen (2018), printed with permission.



Figure 6, The archive in the exhibition FOLK, Copyright Asa Maria Mikkelsen (2018), printed with permission.

In brief, FOLK was divided into two zones, one resembling an archive, the other a small cinema. Objects, photographs, and videos were displayed on the walls, in the archive and on the floor. The round shapes were aimed at creating spaces for conversation, silence, and exploration of stories. In focus in the photograph in Figure 6 is the archive, where the educational program took place, as well as our second co-design phase. As the exhibition at this point in time was on display, we chose to start the workshop around the table in the centre of the archive. In contrast to when we co-developed the Sound of FOLK, we now had access to all the displayed objects and stories. As we in phase two turned our attention to partnering with Shukran and Stephen instead of focusing on a re-design of the existing learning program for a young age group in co-designing with the group of children. The outcome had a stronger attention on planning, conducting, and evaluating the workshop. The conversations that surfaced captured the collaborative activities that had taken place during the first eight workshops.

1.5 SIB team and stakeholders

My plan was to use the opportunity presented by the design of the *FOLK* exhibition to facilitate a co-design process. Ideally, I wanted to wait some months before embarking on the project to give myself time to get an overview of the literature in the field, so that I could have already positioned my PhD research within this literature before I commenced the co-design work. However, the lead curator reminded me how tight the schedule was: it was October 2016, and we were planning for an opening in spring 2018. She also expressed concern about the people we had thus far gathered around the table: we were all well-educated adults, of European origins, and although we had grown up in different countries, we all represented an educated white middle class. It was important to turn our attention towards representation, along several axes: age, levels of education, gender and cultural background. To tackle this multidimensional underrepresentation, I established a research partnership with Professor Dagny Stuedahl at Oslo Metropolitan University, with whom I had collaborated in the co-design project *To and from the youths*; lead curator Dr. Ageliki Lefkadiou, at that time a new colleague at NTM; and NTM technician and Masters student in informatics Tobias Messenbrink, with whom I had developed several learning activities, including the *Radioverket* students producing and publishing radio programmes and the *Friendship and love on the Internet and mobile phones* learning programme (I will elaborate on these programmes later in the thesis). My collaborators (hereafter: Dagny, Ageliki and

Tobias) and I planned, organised, evaluated, and re-planned eight co-design workshops in phase one of the project. In these early stages of the project, I found myself multitasking to establish a research design, organise co-design workshops, reflect, collaborate, and study relevant academic literatures. This was in many ways fruitful and resulted in an abundance of research material. Once the eight co-design workshops were complete and the outcome, which I will discuss in detail later in the thesis, was delivered, Dagny and I then embarked on a follow-up co-design project in collaboration with two young men from the phase one co-design, Stephen Ravi and Shukran Kaakal, and a group of four younger children. We were curious of what type of knowledge and insights that came out of being part of a co-design process. The topics we discussed and designed, in both phase one and phase two of co-design, were related to the themes of the *FOLK* exhibition. Our discussions touched on issues of identity and belonging, what the science says and how science has been used in the past to frame these discussions.

The stakeholders in this co-design process are as follows:

- **The NTM:** In NTM's annual reporting through the museum statistics to the Arts Council of Norway (ACN), the SIB project will be visible. Among other elements in their evaluations of museums, ACN measures research projects undertaken by the institutions. In the next round, this will also count positively for how the museum is managed and is an asset in other applications. Equally, the museum is interested in outcomes that benefit the exhibition making process and as an end outcome to augment the visitor's experience.
- **The district Grorud:** Had an interest in their young representatives engaging in activities connected to a democratic process. The district is concerned about youth participation and involve their council representative in arranging a conference¹⁹ discussing exclusion, frustration, job opportunities and collaboration.
- **Professor Stuedahl:** Professor Stuedahl's interest was to be part of a process that generated research material on co-design practices for her to reflect and work on. Early on, Stuedahl and I were invited to contribute a chapter in the volume *European Heritage, Dialogue and Digital Practices*, edited by Areti

¹⁹ <https://groruddalen.no/nyheter/nar-ungdommen-setter-dagsorden/19.24999>, date accessed 10. February 2022.

Galani, Rhiannon Mason and Gabi Arrigoni. Their editorial comments drove the reflection forward through describing how curatorial reflexivity was impacted by the co-design process.

- **I, the PhD student and Tobias, the MSc student:** The fact that the SIB research project was part of accomplishing my PhD degree in Museum studies and Tobias Messenbrink's Masters in informatics, superimposed a timeframe on the project's own time schedule, which contributed to driving the process forward.
- **The young Grorud Youth Council representatives who took part:** Beyond the opportunity to earn some money, be served pizza and spending time with peers, they were given the opportunity to interact with the museums and creating a digital installation together.
- **The young children who took part:** Were given the opportunity to spend a Saturday at the museum which could be experienced as enthralling. Additionally, the museum asked for their expertise as museum users (Appendix 2) which might motivate for participation.
- **My NTM colleague who took part in SIB:** Beyond bringing more voices into the development of *FOLK*, curator Dr. Ageliki Lefkaditou had a curiosity towards how to be a young urban Norwegian from a multicultural district. She had recently settled in Oslo and didn't know that many people of different age and backgrounds.
- **I, the museum researcher and pedagogue:** The shape of the research questions frames my curiosity in SIB. Furthermore, I am also motivated by this thesis being the first on museum pedagogy in Norway. Personally, the completion of the research will give me opportunities to continue exploring the field of learning and engagement within the context's museums.

1.6 Methodological statement

The SIB research project uses principles drawn from Participatory Action Research (PAR). PAR is rooted in the Brazilian philosopher and pedagogue Paulo Freire's (1921-1997) emancipatory pedagogy. Freire's pedagogy of the oppressed brings forward the notion of curiosity as a foundation for exploration, in learning and likewise in teaching

(Morse 2020, Freire 1970). PAR is a qualitative approach, often with only a small number of participants and interventions that spread over a long period of time. Participatory practices facilitate for open processes that cultivate broad-minded curiosity for the opinions and perceptions of others as important factors in driving joint exploration. One important aspect of SIB was to recognise the young research participants as equal partners and in many respects as experts, who play a specific role in generating the research knowledge (Tsibazi 2013: 157). To keep in mind that empowerment of the participants is essential, PAR shall ensure that decisions are experienced as a joint venture (Denscombe, 2009; Hagen, 2021). The series of semi-structured SIB design workshops were thus organised around collaborative activities and conversations.

Participatory Design (PD) and PAR utilise similar approaches that involve a group of people in processes that enhance mutual learning, equalise power relations and build on democratic principles of giving people agency in matters that concern their life (Bratteteig et al., 2013; Kensing and Greenbaum, 2013). Furthermore, the research activities aim at jointly solving problems and generating knowledge by interacting directly with people, in contrast to a theoretical or critical approach. Nevertheless, there has been a constant movement between practice and theory, to prompt inquiry by a quest to solve problems and improve existing knowledge (Goldkuhl, 2012).

The starting point of most PD and PAR projects is often the lived experiences of the research collaborators, where they operate based on their own experience and knowledge, which evolves as new insights are created through the open-ended exploratory research (Levin, 2013; Tzibazi, 2013a). At the core of PAR is to connect knowledge production with a wish for change on an individual level as well as community/societal level. The key is that people are closely involved in the research, which adds an extra responsibility for safeguarding the process and the individuals who act. It provides a space where distinct voices can be heard, in SIB's case young people from a multicultural district in cooperation with museum professionals. The traditions of Participatory Design and co-design processes has similar features to Participatory Action Research (PAR) methods. The starting point is often close to practice, and the research questions will develop as a result of collaboration (Jensen et al., 2017).

Additionally, the Future Workshop method (FW) (Jungk and Müllert, 1987; Muller and Kuhn, 1993) was used in SIB, in combination with other techniques. This method was

originally developed as a way of empowering citizens to address societal issues and take an active part in processes of democratic problem solving. The method strengthens people who have little experience with using one's own creativity collaborating with others, such as young people and children, and invites them to be visionary and use their imagination (Vidal, 2005). The method is also known among researchers who do PAR, by the virtue of it supporting collaborative processes (Eikeland et al., 2015; Stuedahl, 2017a). Bringing people together through a joint enquiry and exploration facilitates knowledge development. In both traditions, participatory partners are considered experts by the virtue of the perspectives, skills and understanding they bring with them.

In a research project such as SIB, which explores co-design and participatory design in the museum, the term 'partner' instead of 'user', 'visitor' or 'audience' may capture the role of our collaborative partners as active meaning-making individuals (Smith and Iversen, 2014; Vavoula and Mason, 2017). This tweak of perspective to become more human-centred, corresponds with museums as public spaces for social care (Dodd and Jones, 2014; Morse, 2020). Moreover, a distinction between 'public' and 'user' may also be useful, positioning the public as an object rather than a subject (Hetland and Schröder, 2020). In co-design interventions that extend over time, the relationship between the museum and its user evolves, and all members will appear as individual human subjects and become active agents in participatory processes. New collaborations may also occur, as happened in one of the academic papers that is part of this PhD which was written together with two of our young partners. They were closely involved in all related processes – planning, organizing, and implementing, as well as analysing and reflecting. It was natural to invite them as co-writers. They have read the text once and their opinions have been enmeshed and contributed to shaping our thoughts and formulations, a process on which I will elaborate further in my project description chapter.

It is important to point out that neither PAR, PD nor Co-design projects are without power tensions. Erling Björgvinsson and Mahmoud Keshavarz (2020) problematise these perspectives in their discussion of participatory research projects and suggest that by using the term part-taking we will be able to recognise these vulnerabilities. The concept of part-taking opens up an opportunity to refuse to take part, share a part, perform a part or to risk a part. (Björgvinsson and Keshavarz, 2020).

To take a neutral stance when conducting collaborative research and development is

close to impossible. In a co-design process such as the one described in this thesis, where activities and conversations are initiated, it is important to note that as a researcher one is positioning oneself in relation to others, taking into account that one is very much part of the social world in which one acts (Brekke, 2018; Denscombe, 2009; Skjervheim, 1975/1996). In processes where knowledge develops through shared reflections, it is important that everyone has a sense of ownership (Gay y Blasco and De La Cruz Hernandez, 2012).

The research design of this project aspires to make a connection between research and practice while involving several people (museum professionals, young people, students and children) in the process. Another important aspect relates to empowerment and how the process should be an emancipatory trajectory for all participants (see: Levin, 2008; Stuedahl, 2017; Tzibazi, 2013, Eikeland 2020). There can also be a desire for change, for better opportunities, curiosity and engagement among communities and individuals (Freire, 2018). As a researcher I have been deeply involved in the dialogues, and the option to take a stance as an outside observer would be neither possible nor desirable (Light and Akama, 2012).

The research material that I analysed has been generated through several meeting points among our co-design group—in workshops, in closed Facebook groups and at meetings—and has potential to be analysed through other theoretical lenses than those I used in this thesis. Actor-network theory (ANT), which does not make distinctions on understanding human and non-human actors in a network, may reveal how connections between material artefacts and humans occur. Furthermore, it can reinforce the design process as a space where democracy is enhanced (see: Olesen and Knudsen, 2020.; Sandholdt, 2018; Stuedahl, 2004b; Treimo, 2020) . Another approach to analysing the material would be to take a closer look at how the research unfolded according to activity theory, trying to understand human interactions in real life situations (Yamagata-Lynch, 2010).

The workshop structure and methods have had a big influence on the co-design process and outcome. At times it became important to be actively aware of the participation itself, as lack of such awareness could compromise the co-design. This experience reinforces that PD research endeavours are also about learning to listen, which in turn can strengthen the designer as a reflective practitioner (Björgvinsson and Keshavarz, 2020; Schön, 1987) For the listening it was important to have spaces to converse

beyond the organised co-design activities and plenary dialogues, such as when we were sharing food while waiting for all the partners to appear. These leisure spaces provide opportunities for small talk, for rapport and familiarity to build among participants, and for trust and mutual respect to develop at a personal level. These interpersonal relationships further scaffold inclusive, equitable co-design partnerships (Clarke et al., 2021).

The structure of this PhD research project reflects knowledge as something that feeds into the process through dialogue and performance in, and between, the workshops. Within this knowledge production process, I have been both an active agent and a catalyst; this dual role has produced a rich material that needed time and dialogue to bring the reflections forward. It has been a dual process between reflection-in-action and reflection-on-action (Schön, 1987) to let time pass so that other thoughts surface (Ash, 2019). It is obvious that my active participation in all stages brought SIB and the doctoral research into a dialogic co-developmental relationship.

In retrospect, there may have been other opportunities for engagement among the co-design partners that we did not grasp. For example, we could have expanded SIB with an ethnographic exploration of our young co-designers' sociocultural practices, which would have revealed for example that some months earlier they had organised a conference on youth participation and would have given us a clearer idea of what they expected from the museum. We could have included a period of familiarisation where the museum team attended Youth Council meetings at Grorud to raise the young Councillors awareness of the museum and the SIB project, and at the same time to better understand their commitments and engagements at a local level. Moreover, as I will bring forward in my discussion chapters, we could have moved some of the workshops out of the museum and closer to our partners' daily lives.

1.6.1 Data collection

SIB focuses on processes where individuals play a significant role in generating knowledge on several levels and at different times. As this was a qualitative study of process, I have not used any quantitative data in my research, understanding the latter as formal and numerical methods like a survey with multiple answers options (Denscombe, 2009). Nevertheless, in this qualitative research project, various methods have been used to capture qualitative empirical material of collaborative activities and

exchanges. As the investigation rests in the tradition of PAR, the researchers are active initiators and change agents who fulfil roles as both participant and researcher on processes (Jacobsen, 2005; Levin, 2013). The collection of data ran along several axes: personal research log and dialogues in planning and evaluation meetings, audio and video recordings of the workshops, recordings of interviews with co-designers and self-documenting of co-design experiences using GoPro cameras. Beyond keeping a thorough personal research log and combining this with my co-researcher Tobias's notes, other data was captured in audio- and video-recording of the workshops. Though I mainly did the detailed planning before the workshops, in phase one Tobias and I laid a foundation and shared it with Ageliki and Dagny for response. After each workshop all four sat together for around an hour debriefing-meeting reflecting, analysing, and evaluating what had happened as well as planning for the next workshop. In my PhD analysis I also use my own work notes from these evaluation meetings. These conversations have helped me reflect on my professional practice as they generated thoughts on how we orchestrated the co-design activities in the series of workshops within the space of the science museum.

In phase one of SIB, we equipped the participants with workbooks (for making notes) and in phase two we added individual micro-blogging in the books. The workbooks were returned to me at the end, to be kept in the SIB project file at the museum. In phase one, during the workshop five at the Intercultural Museum participants made notes while exploring the exhibition *Typical*, and by appointment they handed in their notes to me afterwards. Also, the notes were used as support in the joint conversation where we all expressed our opinion of the exhibition, as researchers, curators and young partners all noted in books. Later we arranged our notes in four categories: content and architecture, interactivity, social interaction and media. For Tobias and me, the categorisation supported a systematic approach to the findings and influenced how we planned the next workshops (Messenbrink, 2018).

As the museum team alongside Tobias and myself had a dialogue going all through the interactions, both with and without our young partners and Dagny present, the way forward was altered and adapted according to how we understood the situations along the way. In the second phase of SIB, we used the workbooks differently throughout the workshop with the children where they were used for micro-blogging. Encouraging to write thoughts on how the workshop proceeded instead of keywords on how the

exhibition was experienced. Carefully pointing out that the books would have to be handed in by the end of the session. The same happened in phase two, when the children were asked to write their reflections in the workbook on the activities that we had conducted and the discussions that took place. As the youngest participant was 10/11 years old, we believed that everyone could express themselves in writing. However, we made a point of looking beyond typos and ways of expressing in writing. In both phases, the workshops and meetings with our young co-facilitators were video-recorded and audio-recorded. The plenary sessions were recorded with a video camera capturing the table where we sat, and a separate audio recorder was placed on the table. However, as the one camera was set in a corner, it was difficult to capture the interactions when our partners worked in groups. When Tobias, Dagny, and I sat together looking through much of the material from the first sessions, we found that the film recordings did not add insights beyond our transcripts of dialogues. In addition, when doing tasks in small groups, the participants were equipped with a GoPro camera to self-document their work. This turned out to be not very successful for all groups: several came back with a series of still pictures and no recorded sound. Others had placed the cameras on the tabletop and only captured hand movements, and as the action cameras were not very good at capturing sound, there were no usable recordings of conversations (Messenbrink, 2018). There were, therefore, no usable records of small group work during the workshops. Nevertheless, activities and exchanges during small groupwork were discussed in the interviews, which were audio-recorded and transcribed alongside the research logs and most of the conversations during the plenary workshop sessions. In phase two, we engaged an external person to be responsible for the filming and voice recording of the workshop. I chose parts of the filming to be transcribed, as having the dialogue written down helped me and my co-researchers to better understand what happened.

Additionally, at the very last meeting of phase one, our young partners filled in an interview form comprised of mainly open-ended questions. We also asked for a written evaluation of the Sound of *FOLK* sound installation, and there we had some questions asking how the process was experienced. In addition, six co-design partners from the first phase were interviewed face to face, by phone or Skype, these semi-structured conversations took place some months afterwards. The conversation continued in phase two with two young men and contributed to the analysis of how the co-design process

was experienced over time, giving space and time for reflections on the first series of workshops to surface. We arranged meetings at the museum, together with Tobias I interviewed two of the participants, then one explainer at her place of study. I conducted two interviews on Skype with the eldest participants who had moved to other countries and towns to start higher education. Finally, I had one interview at the museum with one young man from the first series of workshops, who at the time was hired as assistant explainer during the summer holidays. All these conversations have increased our understanding of the relationship between the museum professionals and young people. Within these arranged actions and conversations, I searched for evidence and reflected on how a science museum impacts and is impacted by a co-design process in the light of it being a knowledge-creation process. Furthermore, phase two also provided an opportunity for reflection on the whole co-design phase. Dagny and I had meetings Shukran and Stephen before and after the workshop. These conversations were recorded and transcribed and played a significant role in generating knowledge and understandings of actions and co-creating processes.

I have kept the transcripts electronically on an encrypted external hard drive and have kept the paper-based workbooks and my notes in the SIB project file, which is securely stored in the Head of NTM Administration's office. The transcripts and all the quotes that I am using from the notes/workbooks are anonymised for all but two of our co-designers – Shukran and Stephen who stayed with us throughout the project and have co-authored one of the research papers with us, and who expressly consented to being named in publications and reports about the research findings. Five years after the end of my thesis research, both my notes and the workbooks will be securely shredded, and all electronic transcripts will be securely and permanently deleted.

This multiple-source data approach has at times validated statements, perceptions, and interpretations as is visible in Tobias's and my research logs as well as in the transcription of interviews and dialogues. Our notes did not follow a fixed format, but rather were more associative in the sense that we wrote in detail what we experienced as having worked well or not. The same goes for the notes we asked our partners and participants to write, more to support their and our reflections, and for the questionnaires our partners completed after the first sessions of workshops. Nevertheless, the writing process has been important in thoroughly analysing the various episodes, conversations, and actions that occurred during the co-design

processes.

Since I am investigating how this co-design process has impacted the NTM as an organisation as well as reinforced the museum as a space for dialogue, my attention has been on data that discuss these perspectives. As there has been a close connection between the designers and researchers, exploring alongside each other, it was natural that the research material emerged through an interrelationship between praxis, readings, discussions and actions (Levin, 2013). I did not place myself in a corner to observe, but took an active part in the interactions, trying nevertheless to let the conversations and actions develop naturally among the co-design team. Furthermore, it was the museum (or here the research team) that brought the people together, and as we embraced the semi-structured format of conducting a co-design process, it changed and moved in tandem with the development of *FOLK* in phase one and within the space of the exhibition in phase two.

1.7 Ethical considerations

All through the process we paid close attention to follow the rules of General Data Protection Regulation (GDPR)²⁰ and ongoing informed consent. As this PhD research, more specifically, explores the usage of co-design workshops to engage young visitors with the museum, there has been a strong focus on safeguarding all participants. During the whole period I oversaw the SIB research programme with these ethical considerations at the forefront. Young individuals have been involved, mainly above 16 years but some younger. In addition to a strong attention on how to treat the research material, ethical considerations have required gracefulness in treating people at all stages of the project with mutual respect and consideration. In one way my professional collaborative partners, my colleagues at NTM and the collaboration with the Oslo Metropolitan University and the University of Oslo, secured the process. Nevertheless, this has not exempted me from liability, I still have had to be very aware of providing enough information for participants to give their informed consent (Appendix: 1, 2, 3, 4, 5 and 6). A co-design process consists of a series of activities and conversations where big and small decisions are made along the way (Bratteteig and Wagner, 2016). It is important to keep a watchful eye on such a series of actions to ensure a rewarding process for everyone involved (Lynch, 2011; Modest, 2013; Tzibazi, 2013). When it

²⁰ <https://le.ac.uk/brexit/gdpr>, date accessed 18 October 2021.

comes to ethics, ground rule number one is that the researchers have to protect the interests of participants (Denscombe, 2009). While this was a museum project, the collaboration with the University of Oslo through a master's student and a university professor meant that we would be researching the collaborative processes involved in co-design and how they impact the development of museum exhibitions. We therefore applied for approval by the Norwegian Center for Research Data²¹ through the University of Oslo (UiO), in March 2017. We received a notification of approval in May 2017. Appendix 7 and 8 contains the application and the approval letter, and my English translations of these. The Norwegian Center for Research Data (NSD) through UiO approved the research design and the research subsequently received approval by the University of Leicester's research ethics committee.

Involving young people in research projects where we elaborated on issues connected to identity and belonging with a perspective on the multi-cultural nature of the group, must be handled with care and respect. To recruit our young co-designers, we reached out to the Grorud Youth Council keeping in mind that they both as a group and as individuals would bring valuable perspectives into the participatory process connected to the theme of the exhibition. As mentioned earlier, the *FOLK* team needed a more diverse assembly of people whom to have a conversation with on questions of how to be a young person in today's multicultural society. However, we recruited the young persons as a group coming from a multicultural district, not as multicultural by proxy. For me, the distinction is important as the latter points to an understanding of our collaborative partners as being a young person from a migrant background as their primary characteristic; whereas the former opens up for more variety of entrances and aspects of acting in the world as urban youths. This approach does not unilaterally focus on differences, rather it challenges the stereotyping of differences.

When involving children and young people as co-designers, and in this case also as co-researchers, it is important to care for the participants; to ask how to support their active involvement, put attention on the issues of power, and to question what are the benefits and gains of the project as well for each individual (Kirby, 2004; Lynch, 2017). While ethics should always be at the forefront when museums facilitate spaces for human interactions, the communication and anchoring of a research project must go through a

²¹ <https://www.nsd.no/en/>, date accessed 18 October 2021.

responsible caretaker when the research involves young persons below the age of giving their consent. Raising issues connected to the themes of belonging, ethnicity and identity also requires a careful approach to avoid making anyone feel they are being singled out or forced to share thoughts and ideas. Even though all our participants in the first phase were above sixteen and could give their consent on their own, they still weren't adults and as researchers we had to be aware of that.

All of the workshops took place at the museum after closing hours except one, which involved a whole group visit to the Intercultural Museum in Oslo (workshop 5, the 'critique' phase of the Future Workshop series). As all the collaborators were present in all the workshops, the young people were at no point left alone with a single researcher. In the second phase of the project, which involved younger children, it was their parents/carers that gave consent, and they were present at the beginning and end of the four-hour workshop. I was the lead organiser of all of the workshops, and all of my collaborators were present and contributed to the discussions and the design activities with the young people. The topics discussed were related to the themes of the *FOLK* exhibition. We touched on issues of ethnicity, identity and belonging, what the science says and how science has been used in the past to frame these discussions. Care was taken to ensure ongoing consent by the young co-designers, ensuring they were reminded at each workshop that their participation was voluntary, and they were free to withdraw at any time. In fact, a few of them did not participate in all of the workshops; some were dipping in and out and others attended only a single workshop, while only two took part in all of the first stage workshops (and went on to lead the second stage workshop).

We expect that sensitive and personal information about race / ethnicity and political opinions will surface, on the basis of the project's main theme. The themes will be discussed in a plenary and open dialogue. We will ensure that no one will feel pressured to release sensitive information in the discussions.

We therefore believe that the youth can consent to this themselves"

The above quote is from our application to the Norwegian Centre for Research Data, described and applied for at the very beginning of the SIB research project. We are as the text shows, acknowledging the sensitive character of discussing racial categorisation, in light of the long history of race as a scientific concept. Understanding of the concept of race in the Norwegian context Ageliki elaborate on in her TED talk

“confronting race in the 21st century Norway”²². No racial categories are to be found in legal documents and forms, as the Norwegian government does not collect data on race, neither while enrolling to university or by health care authorities. Underlined by Professor Yan Zhao that state in the FOLK Exhibition catalog: *“I think that in Norway as in other Nordic countries, there is a silent articulation of race. Or I would say, there has been a silent articulation of race.”* This by no means excludes that racism is a troublesome issue in the public debate as well as in private lives. We approached the theme very carefully in open and safe plenary conversations, not asking for sharing of personal experiences, feelings, or opinions. Prior to the series of workshops, we had discussed how to respond if unpleasant situations happened. We decided to make clear statements on how the research project and the exhibition was placed within an anti-racist conception of society. As we knew that the Grorud youth council also worked along the same lines, we did not set up conversation rules, like we had prepared for during the public FOLK meetings (Stuedahl et al., 2021). Nevertheless, I was prepared to handle uncomfortable situations, resting on my experience as a museum pedagogue establishing trust with new groups of people on a regular basis. Furthermore, it is important to acknowledging that individual experiences were welcomed, and a safe space was created for it. Our dialogues rotated around the key term’s namely identity, belonging and ethnicity, emphasizing on a shared exploration of the concepts.

1.8 Outline of thesis structure

This is a practice-based PhD which consists of three academic papers, of which one is published and two currently are subjected to peer review. I have also published a professional paper and produced a podcast reflecting on my practice. My three academic papers connect in different ways to my three research questions and relate to the distinct phases in time and approach. Inevitably there is some repetition across the three papers, especially around the project descriptions as well as when touching upon method. Nevertheless, as explained below, each paper makes a unique contribution and covers a different aspect of the research.

²² <https://www.youtube.com/watch?v=M68SGuMLdZI>

1.8.1 Participation and dialogue: Curatorial reflexivity in participatory processes (2019)

Stuedahl, D., Skåtun, T., Lefkaditou, A., & Messenbrink, T. (Published)

The first paper is the chapter ‘Participation and dialogue: Curatorial reflexivity in participatory processes’ (2020), published in the Routledge edited volume *European Heritage, Dialogue and Digital Practice*, edited by Galani, Mason and Arrigoni. The paper discusses the different forms and levels of reflection that the co-design process generated through dialogue. It connects to my research question about how museums hold potential for facilitating dialogues between experts and non-experts and how this reflexivity generates knowledge. Furthermore, it looks into how the museum’s organisation is impacted by knowledge creation that occurs during a co-design process. The paper shows how judgements and concerns relate to institutional and professional responsibilities and argues that co-design and participatory projects in exhibition design necessitate a constant process of reflection, setting and adjusting aims in response to challenges. I wrote the first draft of this co-authored paper. As the writing process evolved, I further contributed a thorough case description as well as refinements of the arguments in dialogue with my fellow authors and the editors. This article is presented in chapter 4, and republished in this thesis, according to license agreement between Torhild Skåtun and Copyright Clearance Center on behalf of Taylor and Francis (books) Limited UK (Appendix 10)

1.8.2 Co-design as museum programming: engaging (non-visiting) youth in museum activity design

Skåtun, T. (submitted)

This article explores the potential of a co-design process to facilitate affective museum engagement. Using perspectives from Participatory Design (PD), the discussion focuses on engagement as part of the research process. Connected to my research question on how museums can be spaces for dialogical interactions across professions and age, this paper centres on the potential of engagement that co-design meetings between youths and museum staff hold, centred around museum programmes and exhibitions. Furthermore, the discussion examines how collaborative endeavours that are longitudinal enable a deeper engagement with people, spaces, and objects.

1.8.3 Knowledge development through co- design interventions

Skåtun, T. Stuedahl D with Kaakal S., and Ravi S, (draft).

In this paper, we investigate how knowledge developed through our co-design interventions. Moreover, we examine how co-production of knowledge connected museum staff with co-design partners in reflections, as one of my research questions points to how museums share their insight and understanding and transform to a mutual space of learning. This co-authored paper looks at how co-design functioned as a method to open up communication programmes and learning activities to integrate perspectives of controversy, discussing along matters that are complex and which create disturbances. Furthermore, we look closer at how a museum can understand itself as an active agent in young people's learning and engagements ecology. We are especially concerned with the question of the investment and benefits for our young co-design participants and partners and have had input from our partners to maintain a focus on the actions and conversations that they experienced as meaningful. I led the writing of this article, including proposing the central ideas and producing the first draft. Redrafting and finalizing this draft have been a dialogical process between myself and my co-authors. This has been process of opening up, then stabilizing and then re-opening and then re-stabilizing. In many ways, the writing of this article has resembled a co-design process.

Future Workshop a structuring tool for co-designing with young people (2020).

Skåtun, T. (Published)

In the spring of 2019, I was invited to take part in the project 'Youth Critics' organised by the Norwegian Museums Association to increase the engagement of young people with cultural institutions²³. The initiative built on museums' important position in ensuring a broad and critical approach in order to develop how institutions engage with young people as a way of fulfilling their role in society of fostering a well-functioning public. My focus was on the usage of the Future Workshop method, and the professional paper I wrote about this project connects to my research questions about spaces for dialogical interactions and methods for museums to be active agents in a young person's learning and engagement ecology. In the essay, I reflect on the two

²³ Norwegian Museums Association, 'Young Critics: a guide for children and young people's critical participation in museums', <https://museumsforbundet.no/unge-kritikere/>. Accessed 1 November 2021.

rounds of co-design interventions for SIB in the context of exhibition design based on collaboration with two young partners and how our process enabled them to become co-design leaders. The paper elaborates on Future Workshop as a method that facilitates both the production of outcomes (exhibits, programs) and the development of deep and meaningful partnerships.

1.8.4 Podcast, reflecting on practice communicating with my fellow co-designers

Skåtun, T. (Published)

Nearly a year after the last co-design activities, on the 9th of March 2020, I set up a recording session with the partners, Ageliki, Dagny, Tobias, and the two young men Shukran and Stephen, in a soundproof room at NTM with an external radio technician. I led the recorded conversation by asking questions and probing for details about each participant's experiences in the co-design process. We recorded approximately one hour of material, which I edited down to 24 minutes and then expanded by 20 more minutes of me narrating the podcast, contextualising the recorded conversation and connecting it to my research questions about method and development of knowledge. The podcast concluded with a call for a closer relationship between the museum and external partners through the co-design process that in turn may encourage a more socially engaged museum practice. The podcast is published on the University of Leicester's webpage at: <https://doi.org/10.25392/leicester.data.14216021>



Figure 5: The Sound of FOLK. Close by the entrance to the exhibition FOLK and Music Machines. This installation is the direct outcome of the co-design process discussed in this thesis. The activity allows for two persons to collaborate on describing their feelings using soundscapes. One can choose from a limited selection of feelings and from among 100 sounds. The sound is then uploaded to directional sound speaker for all visitors to interact with. Copyright (2019) Torhild Skåtun.

Except for the phase of writing up the summary to capture the whole SIB research project and two of my papers, this research endeavour has been collaborative through to the completion of the reflections. It has been natural for me to write and discuss with my co-designers, and the fact that a collective work has been a thread throughout the process has created greater room for pluralism. Perhaps this became most evident in the podcast where there were five of us reflecting on practice. Nevertheless, the process of writing together to sharpen as well as anchor the argument, has nourished the research in several ways and has contributed to clarify the questions as well as the approaches to analysis. To publish alone would in some way undermine the contributions of my collaborative partners, be it museum professionals or young people.

2. Literature review

As a senior pedagogue at a science museum, I have considerable experience in organising, developing and facilitating programmes for the school sector, family groups, prison inmates and elderly people with dementia. I have used collaboration in different ways both as a central feature of the activity itself, and while developing programmes together with health professionals, teachers and the prison school services. I have often challenged the transmission model and facilitated for dialogue (Hein, 2002; Hooper-Greenhill, 1999; Falk and Dierking, 2000), as I could see that collaborative processes and activities engage people.

Co-design is closely connected to participatory practices, aiming at blurring the boundaries between different stakeholders, as well as taking into consideration the difficulties in properly understanding the user's needs, values, cultural and societal assumptions (Ciolfi et al., 2015; Mygind et al., 2015). When using the term 'co-design', I understand it as a collaborative design process: something that the museum does together with its users rather than for them. The term itself rests in the tradition of Participatory Design (PD), a process that supports mutual learning for all participants, though with an emphasis on the designer understanding user needs (Bratteteig et al., 2013; Simonsen and Robertson, 2012). Both PD and co-design traditions designate the facilitation of an active involvement of persons with objects as well as other humans. Such active involvement includes professionals and researchers in collaboration with each other and with end users, designing exhibition and learning programmes (Eikeland, 2020). Furthermore, the term 'collaborative design' emphasises blurring the distinction between user-partners and the professional team (Ciolfi et al., 2015).

At the same time, there is a focus on considering power relationships and degrees of participant impact in both PD and co-design (Mygind et al., 2015; Stuedahl, 2018). While participants may nevertheless not know what to expect at the start of a PD project, strengthening awareness of the purpose and contributing to the creation of a safe space for dialogue and interaction may be useful techniques during the process (Katrikh, 2018). Openness around presumptions from everyone involved, as well as valuing the process of human encounters rather than the outcomes, are salient aspects of the co-design process. However, as in SIB, to involve users in participation at an early stage within museum development of the programmes and exhibitions is somewhat

new. In one of the earlier examples, Gunnar Taxén conducted participatory work within museum settings in Sweden, in which he called for an anchoring at the museum professional level as well as the management level and stated that setting forward a common goal with the participants was essential (Taxén, 2004). Facilitating a process that sets a common investigation at the centre can be considered similar to a cooperative enquiry, using children's everyday engagement as a point of departure. (Anastopoulou et al., 2012; Dindler et al., 2010). In co-design projects, we strive to equalise the participants' role, viewing everyone as experts in their own lives and giving the collaborative partners a stronger say (Smith and Iversen, 2014; Stuedahl and Skåtun, 2018). The method is inspired by approaches that place the end-user as a starting point of development (Ciolfi et al., 2015; Taxén, 2004).

When museum practitioner Nina Simon published her book *The Participatory Museum*, the term 'participation' gained strong traction in the museum world and contributed to a shift towards a more user-oriented focus (Simon, 2010). However, collaborating with external partners is not completely new (Davies, 2010; Sandell in McSweeney, 2016), and interaction revolving around museum artefacts is in the very essence of museum work if the activities of museums is understood as humans working with objects (Brenna, 2016; Modest, 2013b; Ruud, 2012).

The concept of participation was articulated by the New Museology discussion which highlighted the regimes of power, distance, mutual benefit and collaboration (Hooper-Greenhill, 1999; Morse, 2020). Stephen Weil's famous note that museums have shifted from being about something to being for somebody (Weil, 2002) contributed to paving the way for Simon's focus on participation a decade later. Museums are now more widely seen as dialogical arenas with the spaces and opportunity to empower communities, build citizenship and strengthen democracy (Biesta, 2015; Modest, 2013; Sandholdt and Achiam, 2018; Smith and Iversen, 2014; Tzibazi, 2013).

This literature review explores in depth parts of the museological discussion that are applicable to this research endeavour. Arguably, it is not only the last decade that has put the museum user as a starting point of development while exploring museums in connection to communities, young people and children. A wide variety of approaches to communicating with audiences can be traced in the history of museums, and the literature review starts by tracing that history in the emergence of the New Museology (section 2.1). It then moves on to look at science museums more closely, and how the

emergence of the science centre movement in the late 1960s, with its emphasis on ‘hands on’ activities to unpack the deep connections between science and society (Oppenheimer, 1968; Pedretti and Iannini, 2020) (section 2.2). A closer look at what research tells us about the messiness of co-design and issues of control, dialogue, silences, and interruptions (section 2.3) before situating the discussion within literatures on engagement in the science museum (section 2.4).

The review will start by taking a step back and looking at how the institutional reflectivity grew aligned with a scholarly curiosity of the museum’s role in society. This is followed by thoughts of how to understand visitors’ interactions with objects and people within the space of a science museums, before a more focused gaze on co-design traditions with its possibilities and challenges. Arguably, does co-design with its open-ended format calls museums to question their authoritative voice as well as the demarcation between experts and non-experts. Another question is what happens when the museums put aside their role as the teacher and encompass young people in development of programs and exhibitions. Furthermore, an examination of the concept of boundary objects as a way of understanding negotiations and translations during the co-design encounters. The literary review closes with bringing forward the mindset of the Future workshop and how it may work as a framework for direct input to the design deliverables.

2.1 The New Museum debate

From the 1920s, museum audiences were somehow seen as passive recipients both in museums and other mediated platforms such as television, a view that was followed in the 1950s by research on the impact of media on its users (see historical accounts in Hooper-Greenhill, 1992; Hein, 2002; Hetland and Schröder, 2020). From the 1980s onwards, the focus of research on encounters between humans, texts, objects, and technologies that take place within the museum space, turned to meaning-making with a clearer emphasis on the a priori understanding and knowledge visitors bring with them (Bennett, 2013; Falk and Dierking, 2000; Hein, 2002; Hooper-Greenhill, 1999). This has also materialised in an expansion of more specialised professions within the museum field, both in conservation and communication (Bjerregaard, 2019). Several major studies have been undertaken in the last decade, such as the Danish DREAM project (Kobbernagel et al., 2015). These have explored digital technologies as tools for

museum dialogues, allowing for multifaceted entrances to research on museum communication.

The institutional reflectivity that emerged in the early 1980s encompassed a wide range of themes and approaches to museum communication and understanding of the role of museums. A characteristic is the turn to the idea that museums can be activist, communicative and social institutions (Graham, 2016; Hooper-Greenhill, 1999; Kidd, 2014; Ross, 2004; Sandell, 2016). Another common view is that of museums as institutions with the responsibility for displaying objects and stories that point to contemporary challenges, such as discussing colonial history (Fowler, 2017). An example may be the recent climate exhibition (2020-21) at the NTM, which highlights the challenges related to contemporary climate change. Beyond a wish to create a space for interaction and dialogues around climate change with the public, there is a parallel motivation to challenge the museum internally to act on reducing its environmental footprint in how exhibition and programming is developed and designed (Bratland and Sørli in press 2022). There are many different ways of understanding the role of museums in society amongst museum professionals, also within the same institution (O'Neill, 2006; Sandell, 2016). This leads to complex negotiations between museum professionals, departments and the wider museum community.

On the other hand, museums have in many ways not really changed in the last 200 years. They are still monumental buildings that display objects and artefacts, somehow resilient in a world where many institutions in society are changing their form and appearance (Bennett, 2013a; Hooper-Greenhill, 1999b; O'Neill and Hooper, 2019a). Nevertheless, museums do not exist in a vacuum: they are, and have always been, closely connected to the society which they are part of, act in and coexist with, having at all times a goal, realistic or not, to function as arenas to educate and enculturate the public (Barrett, 2012; Kieding and Sonne, 2021).

Although not all museums started out as publicly funded cultural institutions, many have become so over time. This means that they have also been politically motivated and controlled. In Norway, as in many other countries, museums were established as part of building a national historical narrative. In later years some of the exhibitions have been questioned and criticised for presenting one-way stories (Lien and Nielssen, 2016). Cultural policy from the UK in the late 1990s onwards has put a sharper focus on the perception of cultural heritage institutions as important actors in strengthening civic

participation (Brekke, 2018; Morse, 2020).

A similar direction can be found in Norway, which also sees cultural policy as a tool for building citizenship. As Arts Council Norway recently wrote in a response to the government's plan for sustainability in Norway,

“at the individual level, culture is an arena for the need for expression, development, belonging and identity for the individual. At the societal level, culture is an arena for criticism and discussion that builds community, enculturates and contributes to development” (Hernes, 2020)²⁴

Museums can be understood as complex assemblies of meaning and as mediated spaces for social experience and learning (Stuedahl, 2018; Thomas, 2010). They are also considered as complicated organisations with a desire to collect, preserve, display, educate and connect to local communities, responding to many expectations in society (Alberti, 2017; Hylland, 2017). At the same time, museums are places where the most complex issues questioning history as well as how to be human in society today are played out (cf: Lefkaditou and Kyllingstad, 2020; O’Neill and Hooper, 2019; Schorch and McCarthy, 2018). Beyond that, museums need to extend their boundaries and to encompass new user groups as well as serve as a third space that stimulates cross-boundary encounters and experiences through collaborative interventions (Bunning et al., 2015; Lynch, 2011; Pruulmann-Vengerfeldt and Runnel, 2018; Vavoula and Mason, 2017).

There are several reasons for this. First, it is necessary for museums to be part of a closer dialogue with the surrounding society in order to be important and relevant to the public. Over the last three to four decades, museums have taken a more pronounced turn from having a rather inwards perspective with their gaze fixed on collections, to looking outwards towards their visitors and users (Greenhill, 1992; O’Neill and Hooper, 2019; Weil, 2002). This change of focus is being discussed in academic publications where scholars raise timely questions around how museums relate to the power and authority they hold, such as Witcomb’s suggestion that we must question who gets to speak in a museum (Witcomb in Pruulmann-Vengerfeldt, 2018 p. 146); or Bennet’s argument that museums are powerful in the sense of enabling governmental education and control of

²⁴ Input from the Arts Council on the action plan for the sustainability goals, 27 November 2020: <https://www.regjeringen.no/contentassets/793e429727db46539d67fa664fdcb029/kulturradet.pdf>, date accessed, 07 October 2021. (my translation)

the population, similarly to schools and universities (Bennett, 2013).

In recent years, several museums have made programmes that facilitated wellbeing using their collections and exhibitions as a starting point. A characteristic feature is that the programmes are dialogically arranged and the participants' own experiences, insight and knowledge are the starting point of the conversation, an essential feature, for example, in programmes developed for people who suffer from dementia (Folge et al., 2013, Dodd and Jones, 2014; Welsh, 2005). In some ways, museums have moved from being object-centred to being people-centred institutions, acknowledging that interpretations of objects and collections require meaning-making by various user-groups in order to achieve relevance in contemporary society (Achiam, 2019; Greenhill, 1992; Hein, 2002; Hein, 2011). Initiatives with a strong focus on exploration together with users have facilitated 'public labs', in order to commence or strengthen conversations between experts and non-experts²⁵. In several research and development projects, such dialogue has expanded to include visitors outside the museum's core audience (Bunning et al., 2015; Dawson, 2018; Sandholdt and Achiam, 2018). To reinforce the understanding of visitors as active meaning-makers the term 'user'²⁶ or 'partner' instead of 'visitor' or 'audience' may be more useful, as these terms suggest more agency in the relationship (Smith and Iversen, 2014; Vavoula and Mason, 2017). Similarly, in media studies Hetland and Schröder (2020) distinguish between 'public' and 'user', noting that 'user' suggests a more active involvement as a subject than 'public'.

Central to the new museology are perspectives that emphasise the constructionist character of museums, as arenas where knowledge and experience develop in encounters with exhibitions and programs. We also have to take into consideration that visitors and collaborative partners enter the museums with a set of a priori knowledge and experiences (Bevan and Xanthoudaki, 2008; Hein, 2002; Hooper-Greenhill, 1999; Kidd, 2014). Moreover, a constructivist feature is to recognise and value competences and insights the users bring with them as active makers of meaning in their own realities. In this conception, knowledge and learning objectives are not fixed. A

²⁵ An example from a Norwegian museum projects where museum professionals work alongside non-professionals would be the *Congo Gaze – People, Encounters and Artefacts* at the Cultural Heritage Museum in Oslo collaborating with the Congolese community in Oslo making an exhibition. <https://www.khm.uio.no/english/visit-us/historical-museum/exhibitions-archive/congo-gaze/>, date accessed 8. October 2021

²⁶ In Norwegian the word "user" refers to users of health services, whether they are drug addicts or elderly people suffering from dementia.

constructivist exhibition or learning experience is recognised by its invitation to experiment, question and draw new conclusions (Greenhill, 1992; Hein, 2002). Likewise, the concept of 'science capital', used within an informal STEM-learning setting such as a science museum, can help us frame learning settings that are engaging. I have noticed that one important component of building science capital is to create a personal and local connection to the topic, and further to value and link the knowledge and insights into everyday life and the understanding one brings into the situation²⁷ (Archer et al., 2015). However, making strict divisions between the transmission and dialogue model within the field of science communication is also not correct. The two models have always co-existed in a landscape of science communication that is more diverse (Alan Irvin in Davies and Horst, 2016 p. 225). From this perspective, a science museum can be viewed as a mutual, reciprocal learning environment where both the museums and the users are learning from each other, and where exhibitions and educational programmes are a way of scaffolding the interaction (Ash, 2019).

2.2 Science museums in society

Visitors to science museums often expect to find an objective truth, or simple answers to rather complex questions (Bitgood, 2010; Dillon, 2017; Humphrey and Gutwill, 2017). The museum provides opportunities for exploring and learning, for people to make meaning of a world through their interactions with objects and artefacts (Spitzer and Fraser, 2020, Falk and Dierking, 2000; Hooper-Greenhill, 1992; Hein, 2002; Winstanley, 2018). Within this discussion, science museums can be good discussion partners. When exploring the collections and the exhibited objects and artefacts of a science museum, many stories unfold and represent the complexity of society in many ways (Achiam and Sølberg, 2017; Welsh, 2005). Moreover, we have to keep in mind that people mainly believe that what is on display in the science museum is the truth, and many exhibitions emphasise this narrative (Macdonald, 2007). Similar to other museums of cultural history, science museums also need to be aware that their way of telling stories may represent simplified and biased representations of history (Dawson et al., 2020; Bennett, 2013; Witcomb, 2020). Despite their interactivity and often playful entry to scientific issues, science museums frequently aim to present complicated

²⁷ UCL Institute of Education, 'The Science Capital Teaching Approach Animation' [, date accessed 21 September 2021.](#)

scientific controversies in a simple way (Dillon, 2017). This may be a response to the expectations of museum visitors, who wish to learn science at a science museum. This conceptual turmoil around science communication within and outside museums is indicative of the diversity of disciplines, theoretical and practical approaches and multiple interests involved (O'Neill and Hooper, 2019). In addition, studies in STEM (Science, Technology, Engineering and Mathematics) learning, which connect discussions in science education with science museums and centres, actualise new mindsets and approaches to the field (see: Henriksen and Frøyland, 2000; Achiam, 2019; Dillon, 2017; Rock et al., 2018). In Norway, as in many other countries, there has been a close connection between science centres and STEM. In 2010, the Norwegian Ministry of Education and Research launched a plan (2010-14) to increase interaction with science-related issues. To achieve this goal, science centres played a role in connecting science to everyday life as well as providing spaces for encouraging higher education within these subject areas (Eikeland, 2020).

Another challenge that science museums often encounter is how to effectively deal with issues of representation and misrepresentation (Pedretti and Iannini, 2020, Dawson, 2018; DeWitt et al., 2019). Stuart Hall (1997) explains that culture is understood as a series of mind-sets that are fluid and changing over time among groups and individuals. Where people and institutions meet there is a need for translation, or in Hall's words, 'for encoding and decoding, between and among participants to explore meaning together'. It is a well-known fact that highly educated adults with their children remain the main visitor group for science museums; they are trained in inherent codes on how to behave when dealing with objects and spaces, eager to fill and model the role of the ideal visitor (Feinstein and Meshoulam, 2014). Unless the museum actively seeks to engage with those outside this well-trained visitor group, then the museum's products will continue to cater for this group only.

Emily Dawson suggests that science museums and centres are not made for everyone and that in many aspects they support the existing structural differences in society (Dawson, 2018). This happens on several levels, including in the objects and stories that are told through exhibitions and in the way language is used on labels and sign. While most citizens are active consumers of culture in various ways – be it watching films, reading books or following series on television, still museums are irrelevant for many groups as spaces for exploration and learning (Dawson, 2018; Sandell, 2016). Even if

aware of social inequalities, science museums still tend to emphasise serving their familiar core visitor group (Feinstein and Meshoulam, 2014). For these institutions to become more inclusive, one approach could be to involve non-visiting groups and individuals in the development of programmes and exhibitions that would then be experienced as relevant by these underrepresented audiences (Dawson 2014).

Another aspect to making the science-learning arena more inclusive is developing a broader understanding of different skills and knowledge, as well as other ways of interacting with science (DeWitt et al., 2019). In this context, a visit to the science museum is only one of many encounters with science. It may also be too much to expect that a one-off visit on its own will make an impact and generate a closer connection between the individual and science, or that it may increase science capital (Dawson, 2018; DeWitt et al., 2019; Winstanley, 2018). Furthermore, it is important to acknowledge that taking part in a one-off educational programme may not change the individual's relationship with the institution. Nevertheless, we must keep in mind that it is possible to arrange for experiences that connect different learning arenas by inviting participants for collaboration. Through collaboration, curiosity and engagement can be aroused and nurtured.

Facilitating longer-term interactions such as co-design interventions with museum collections and objects, may strengthen the individuals' connection to the museum and the collaboration outcomes. At the turn of the last century, John Dewey drew similarities between libraries and museums, envisioning a more integrated learning ecology for children and young people (Dewey, 1934/ 2005; Hein, 2002; Winstanley, 2018; Elffers and Sitzia; 2016). Even so, there is a need for hybrid spaces that provide a more dialectic and enquiry-based approach and that facilitate for co-design and collaborations where various actors explore and co-create together (Achiam, 2019; Dindler et al., 2010; Stuedahl, 2018; Tzibazi, 2013). The range of approaches is reflected in a science museum programme that stretches from one-off co-design events around an idea for a learning programme, to long-term co-design projects. Placing museum users in the centre of the different functions in a museum encourages the professionals to think *with* instead of *towards* (Sandholdt and Achiam, 2018; Smith and Iversen, 2014; Taxén, 2004). This is a turn towards a more complete externalization of the museum (Achiam and Sølberg, 2017).

2.3 Museums and participatory practices

With an ear trained to listen closely, one can view co-design as a method of concept development and evaluation. It requires a new form of professionalism, including the ability to handle uncertainties, be flexible and plan along the way as well as to extend into society and interact with people and communities (Graham, 2016; Kreps, 2011). Co-design is essentially about becoming comfortable with uncertainty. In light of this, managing the cultural authority of museums in constructive ways is important, and at the same time a complex exercise (Hylland, 2017). Museums might be the cultural heritage institutions that are most influenced by changing technologies and changing modes of media usage (Drotner et al., 2018; Henning et al., 2015; Stuedahl, 2018). Media is at the core of all three fundamental museological domains: materiality, engagement, and representation. While participation does not necessarily secure representation, collaborating with external partners who bring their own agendas and perspectives can nevertheless expand the project's perspectives overall (Davies 2010; Graham: 2016; Sandell 2000). One challenge is that the museum employee does not represent the community they serve. It can therefore be helpful to be aware of who is on the inside and who is on the outside of the museum community (Davies 2010). In her book *The Art of Relevance*, Nina Simon (2016) builds an argument around how to make your institution relevant by understanding who the outsiders and insiders are and facilitating access for both. She draws a picture of a museum, or in broader sense, a cultural institution, that needs to serve its publics by offering the right *key* to the entrance (Simon; 2016). Museums must move beyond working with the 'usual suspects' to encompassing a broader society (Dawson, 2014; Feinstein and Meshoulam, 2014; Gurian, 2020). Participatory practice is a way to understand needs and wishes, to broaden the perspective by letting more voices to be heard and seen (Davies and Horst, 2016; Mygind et al., 2015; Stuedahl and Skåtun, 2018).

There are very few educational programmes in museums that stretch over a long time period, although allowing users to interact with the museum over time may strengthen the ties between participant and the institution (Winstanley, 2018). Sometimes we expect that one single visit, often as part of a school group, will have an impact on the relationship between museums and their users. Contrary to taking part in an educational programme, co-design has a longer time span and gives the participants an opportunity to connect more deeply with museum objects and themes. Even so, in many ways a

series of co-design workshops have similarities with educational activities in a museum setting, especially those that are open-ended and with several possible outcomes (Bitgood, 2010; Falk and Dierking, 2000; Hooper-Greenhill, 1999).

Furthermore, it is worth pointing out that there is a big difference between the way big and small museums carry out their participatory practice. Small museums often have limited resources and need to reach out to people beyond the organisation to get the job done, whereas big museums, such as a national science museum, often consider working with external partners as time-consuming and expensive (Davies 2010). A challenge for many participatory projects, however, is that they exist outside the museum's core tasks. Museums educate, collect and preserve; participatory practices come in from the sideline as a new way of interacting with their users (Lynch, 2011). In several cases, co-design projects are conducted with the use of professionals from outside one's own organisation and with external funding, risking a different kind of disconnect from the very communities that co-design has the potential to engage.

2.4 Co-design: control, dialogue, silence, and interruptions.

Two decades ago, inviting the end user to be part of the development was a new approach within museum settings (Holdgaard and Klasttrup, 2014). Furthermore, there were several parallel endeavours exploring PD in sectors spanning from healthcare to theatre production²⁸. The tradition of participatory design in the field of museums contributes to how we understand museum practices in the future, both within the external-facing activities and in handling of the collections and archives. A sensitivity to the voices and interests of the actors and people involved offers a tool to investigate the processes and outcomes (Knudsen, 2016a). Furthermore, in the PD tradition there is the challenge that active citizenship and empowerment recede to the background for the benefit of a more pragmatic approach. Facilitating processes that are flexible and suitable for diverse groups holds the possibility to bridge leisure activities with museum programmes (Dindler, 2010). Rachel Smith and Ole Iversen call for a more holistic approach, suggesting thinking together on a larger scale over a longer period of time.

²⁸Culture of participation, scholars and professionals from several sectors presented their research on participatory practices. <https://conferences.au.dk/culturesofparticipation2018/>, date accessed, 07 October 2021.

They emphasise that working with a network of actors and paying attention to inclusion and social practice will enhance the processes (Smith and Iversen, 2014).

Successful or not, what is often measured is the outcome of the co-design process, rather than the more intangible knowledge and understanding present on a group and individual level. Within a museum setting, when taking part in a process that leads to an exhibition opening, the focus is rarely on the process, but rather on the outcome. PD often appears as messy since full control over the different stages is difficult to retain in a process which is seldom linear. It is also important to note the necessity of clarifying expectations before, during and after as well as in-between collaborative workshops (Hanssen et al., 2017; Holdgaard and Stuedhal, 2021). While the workshop organiser(s) and facilitator(s) may have a clear idea of the project's goals and timeframe with the possibilities and limitations in mind, invited participants may not always be aware of such expectations and constraints. Individuals and communities are often approached because they represent something different from the museum people (Ball and Christensen, 2019; Graham, 2016a), but such knowledge and experience does not necessarily help to articulate expectations about the co-design process. If the co-designers are asked and given time to think and discuss what the aim of the process is for them, this may assist participants in reflecting on their expectations.

When moving the design activities close to real situations behind the scenes at a museum, one has to take into consideration that people are difficult to predict, they are easily interrupted, and interrupt others and themselves (Rogers, 2011). This moving back and forth, translating and negotiating both in the workshops and among the museum staff involved, requires flexibility and planning along the way. A challenge for a trained pedagogue may also be to tolerate silence when it occurs.

Participatory Design (PD) emerged in the 1960s and 1970s in the Western world as citizens wanted to have more influence on the societies to which they belong. An early voice was Sheryl Arnstein (1969) with her 'ladder of participation'. Her eight steps start with *manipulation* and end with *citizen control*, categorising the steps from non-participation, through tokenism to citizen power. A more recent way of viewing degrees of participation is provided by Nina Simon (2010) who discusses the Social Technographic from Forrester Research, the results of a survey of social media participation that identifies five types of social media users (creators, critics, collectors, spectators and inactive) and places them on a ladder of participation. As Simon points

out, one person can find him or herself on a different step on the ladder at different times. Hence, it is essential to keep in mind when facilitating interactive and creative processes that there should be room for various entry points to the programme, and that participants should be allowed at any given time to stand on the step of the participation ladder where they feel most comfortable. On the other hand, the metaphor of the ladder has been criticised for implying that some kind of participation is considered better than others (Onciul, 2013). Further, this linear way of reflecting around participatory practices in museums does not capture the messy part of such collaborative work. In turn this leads to an emphasis on ‘control’ and ‘choice’, and who gets to take the small and big decisions in the progress of a co-design project (Bratteteig and Wagner, 2016; Morse, 2020, p. 42). It is by no means just within the cultural field or the last decades of social media participation that have shaped how we think about participation today (Birchall, 2017b). The way marketers place a potential consumer need at the centre of campaigns and advertising has featured prominently in concepts of participation (Rock et al., 2018). More closely associated with issues of citizenship and democracy, however, is the early PD movement in Scandinavia. Connected to the introduction of computers in the workplace in the seventies and eighties, a participatory movement started concentrating on information-technology based development (Björgvinsson and Keshavarz, 2020; Ehn, 2017a; Simonsen and Robertson, 2012; Stuedahl, 2004b). This movement was related to the democratisation of workplaces, giving the employees an opportunity to influence the transformation of their own workplace, as well as to improve technology in order to develop the best prerequisites for carrying out their work. At the core of this tradition is safeguarding that those who are set to perform the tasks will have a say in the design. This resonates with the already mentioned element of PD, where the process aims to facilitate mutual learning through common investigations and reflections (Iversen et al., 2017; Stuedahl et al., 2019).

When dialogue takes place at a science museum, it illuminates the potential of museums as ‘contact zones’, i.e. spaces where conflicts are put up for discussion, or spaces that provide neutral environments for all participants (Clifford, 1997). However, it is difficult for a museum to be a completely neutral space just by the virtue of its buildings and spaces (see Bennett, 2013; Feinstein and Meshoulam, 2014; Golding and Modest, 2013; Sitzia, 2019). Yet there are many ways to increase accessibility and become inviting to communities and shape new collaborations, as Elaine H. Gurain states in her

open letter to her museum colleagues (Gurian, 2020). Moreover, museums rarely move their exhibitions, programmes, and activities out to where the public is located, instead keeping them within the buildings and on their own terms (Modest, 2013). Still, museums are, in all their complexity, relevant spaces for engaging the public in dialogue on societal, including scientific, issues (Achiam and Marandino, 2014; Sontum, 2018; Welsh, 2005). Processes where experiences are shared and interpreted do not only help to understand what happened in the past, but hold a potential to use the understanding and knowledge in the future (Jamissen et al., 2017; Smith and Iversen, 2014). Making meaning of the world happens through language and dialogue, it is an *us*, not an *I*, that tries to find knowledge. It is related to the context in which one acts and can be understood as relational with one's surroundings. Truth does not exist within one person's head, it is embedded in social interaction through dialogue (Bakhtin in Dysthe et al., 2013; Galani et al., 2019; Rock et al., 2018).

In participatory practices, language may often be a challenge as the way one talks and understands holds a lot of power and authority (Smith and Iversen, 2014; Stuedahl and Skåtun, 2018). Furthermore, language is absolutely essential to bringing about a common understanding, especially when the age range is wide, and the knowledge differs. Yet another aspect to consider is that collaborative participants do not always have a common understanding of the language that can cover processes like co-design and, thus, misunderstandings can occur (Morse et al., 2013; Mygind et al., 2015). A co-design process will be multivocal in the sense that several people with different backgrounds, perceptions and vocabularies interact. Central aspects of how Mikhail Bakhtin understands dialogue is to respect the word of others, be willing to listen, understand the other's premise, use the words of others as tools for thinking and concurrently pay attention to one's own words (Bakhtin, 1935/1993/2010).

To create a more engaging exhibition that is more relatable for visitors is often a primary goal for museums when collaborative processes are initiated (Bunning et al., 2015; Morse et al., 2013). We risk that the processes do not always unfold successfully, and that expectations are not always met. This is illuminated by Nuala Morse (2013) in a description of a participatory process funded by grant authorities: a slightly tortuous process in which questions were asked about both recruitment and expectations from young participants and the museum professionals, resulted in an exhibition that did not correspond with the desired standards set by the funding body nor the museum. Even

though the interests go both ways, the co-designers want to be part of something real and the museum wants to display a co-created result (Tzibazi, 2013). In such a setting, there is little time for anything to fail, to mend collaborations that break up or to find solutions if participants are dissatisfied. It is important to be aware that the museum in reality has complete control, especially when approaching the final part of the process; the museum often edits the result (Lynch and Alberti, 2010). As participation and collaboration practices become more widespread, facilitating co-design processes within science communication becomes even more important (Rock et al., 2018).

Several co-design projects have explored how to facilitate for science learning within science museum. Catharina Sandholdt (2018) focuses her thesis on involving family groups in designing a health exhibition at a science centre. She calls for a participatory entry to development, suggesting that it will invite users to be part of science-in-the-making, and provide science centres with reflexive partners in a dynamic creation of knowledge. Ingrid Eikeland (2020) advises listening carefully to the fine distinctions when engaging with controversial issues and bringing forward an emotional involvement in the intersection between hands-on activities and dialogue.

2.5 Engagement at a science museum: a role for co-design?

A challenge for museums is to facilitate spaces for creative engagement that crosses boundaries and connects different social settings (Dindler and Iversen, 2014; Kumpulainen et al., 2018). According to the Norwegian philosopher Hans Skjervheim, all humans are ‘engaged’ one way or another by virtue of being human (Skjervheim, 1974). It is not possible to act in the world that surrounds us if we are dis-engaged. To design for engagement and interaction in museums is important whether developing exhibitions or learning programmes, because understanding engagement in museums is closely connected to how programmes and installations are perceived (Macdonald, 2007). Museums often talk with an authoritative voice, transmitting knowledge, in contrast to facilitating engagement within the spaces and in interaction with content. Considering that it is a human feature to be engaged, co-design provides better opportunities for experiences if the users are put in positions where they act, talk, and think. In other words, it is about putting users in charge of their own experiences and giving them the steering wheel to navigate their journey with the museum (Humphrey and Gutwill, 2017).

We know it is possible to be critically engaged in an exhibition such as the *FOLK* exhibition, as underlined in the article ‘The co-production of difference? Exploring urban youths’ negotiation of identity in meeting with difficult heritage of human classification’ (Sontum, 2019). This paper concludes with a section about how the participants turned the dialogue into a sharing of daily life experiences, and further states that museums hold a potential to become locations for deep reflection. A way of twisting and developing arenas for sharing may be to explore how engagement is connected to co-design. There is a possibility of contributing to fostering young people’s active engagement with relevant and important topics around being human in society today. In one sense, the fact that a co-design process scaffolds a closer engagement with museum exhibitions and collections lies in the proposition. In various degrees it invites interaction ‘behind the scenes’ to be part of a creative process together with museum professionals, based on enquiry and solving problems together (Dindler and Iversen, 2014; Iversen et al., 2017; Simonsen and Robertson, 2012; Taxén, 2004). In the SIB case, working with youths as resource persons, engaging with the content of the museum opens up new perspectives. Moreover, there are few places in society overall that give young people space for engaging in topics that concern them and provide ways for them to express themselves (Jenkins and Ito, 2015). Interacting with pertinent questions within the frame of a museum provides a possibility to strengthen the young people’s capacity to become active citizens. Nevertheless, basic needs must be met before we have the opportunity to engage with the outside world at all. In Maslow’s hierarchy of needs, physical and security needs must be met before we can move on to seek social needs and recognition, and finally seek self-realization (Maslow, 1971).

Nuala Morse (2020) brings forward in her book *The Museum as Space of Social Care*, the ‘logic of care’ as being in contrast to the ‘logic of contribution’. Caring for or being cared for is a fundamental feature of human relationships. Within a museum setting, the term can be connected to museum practice, caring for objects, collections, staff and users. To care for the past, the contemporary and the future is also well embedded within museum practice. To connect care to participatory practices also makes sense in that such a focus may contribute to providing a safe environment and treating all participants as equal partners. Moreover, putting care at the forefront in a co-design endeavour may open up for several understandings of how the process unfolded, the

conversations surfaced, and the engagement and knowledge materialised (Golding, 2013; Olsen et al., 2020; Morse 2020). We have to keep in mind that it is mainly museums that take the initiative to broaden their perspective through participatory practices, as they are very rarely approached by external partners who wish to initiate collaboration with the museum (Mygind et al., 2015). At the same time, museums are challenged for not really changing their basic structure of communication; they still collect, exhibit and run educational programmes, often without questioning their authoritative voice or taking the public interest as their point of departure (Drotner et al., 2021; Lynch, 2011).

2.6 Knowledge development in museums and through co-design

Linked to a perspective of power relations, participatory practices have been criticised for believing that any collaboration may be symmetrical (Lynch, 2011), either between non-experts and experts or employer and employee. Moreover, PD holds a potential to reproduce power and still underpin processes of cohesion, a balancing act one must be conscious of (Palmås and Von Busch, 2015). Other researchers call for a breakdown of the distinction between non-experts and experts; that we must recognise that both feed valuable knowledge into a collaborative process (Estalella and Sánchez-Criado, 2015; Gunn et al., 2013; Simonsen and Robertson, 2012). In a participatory museum practice, dialogue and collaboration between experts and non-experts in a collective meaning-making process is enhanced. Participatory practices do not take away the professionalism of curators and educators. They just alter the way an expert connects with the communities they are part of, and call for museums to share and expand professional insights with other people (Bennet in Dibley, 2005; Kreps, 2011, Schorch and McCarthy, 2018). Helen Graham posits that the role of the curator in participatory practices can be understood as a continuous process of stabilisation, pluralisation, and re-stabilisation of new representatives (Graham, 2016). Sharon Macdonald understands this as a movement from effect to affect that captures perspectives around emotions and presence, where museums open up for the possibilities for users to bring in their own perspectives and for a reframing of the collections, programmes and exhibitions (Macdonald, 2007). The aim is to facilitate mutual learning through discussion and the negotiations a participatory practice allows for. This can be understood as a dialogic approach to knowledge development (Galani et al., 2019; Ruud, 2012; Stuedahl, 2018). In this sense, interaction between people is viewed as a learning spiral where action and

reflection alternate (Ciolfi et al., 2016). Yet another consideration concerns the power structures within a museum; it is often the educational staff who conduct participatory collaborations. In a museum hierarchy, these professionals have less influence on how museum work is understood, as they often are the lowest paid, with many duties and a lesser degree of freedom at work than, for example, a curator (Ash, 2019). Regardless, the pedagogues are those trained and accustomed to engaging in dialogues with visitors on several formats – facilitating learning activities or communicating with visitors in the museum exhibition (Winstanley, 2018).

A prime task for museums is to facilitate learning which is explicitly connected to the building of knowledge both on an individual and group level. When visiting a museum, we are most often part of a social group, whether it be family, friends, or a school class. Knowledge develops when meeting within the physical environment offered at museums such as the architecture, artefacts, and spaces. In the interplay between these elements, knowledge moves and develops (Hooper-Greenhill, 1992; Hein, 2011; Jørgensen, 2020). In co-design projects, the participants are connected more closely to the museum professionals, in a way that may resemble a teacher – pupil relationship, in the sense of a longer-term relationship where you get to know each other better, though without the power relations that characterise the school system, where grades are to be set, and attendance is compulsory. This type of curiosity about each other's knowledge, interests and engagements can help increase insights from multiple perspectives. Additionally it puts the element of care in participatory practices at the forefront (Morse, 2020).

Another important aspect of museums as educational institutions is their potential to build knowledge across disciplines, such as when experts and non-experts are designing together, through dialogical translations and negotiations, thereby adjusting both understanding and process. By paying attention to the actor's agency and the power relations in participatory processes, we may safeguard multiple voices and understandings (Geib, 2019), while keeping in mind that the aim is to design for an unknown possible future, and in a museum setting for a future experience for users (Van der Velden et al., 2014; Smith and Iversen, 2014).

As highlighted by several scholars (Ash, 2019; Ciolfi et al., 2016; Tzibazi, 2013), to be flexible and plan along the way is essential when embarking on co-designed projects. As one is in close interaction with other humans, things never go exactly as planned,

and the ability to manage, change and improvise becomes essential. The theory of poise and punctuation, well put forward by Yoko Akama and Ann Light (2018) captures how to move within the situated circumstances that a co-design session like a workshop enables. Poise denotes the way one positions oneself in relation to fellow collaborative partners, how to behave and act with focus on self-awareness; punctuation on the other hand, is connected to rhythm, flow, changes and gaps (Akama and Light, 2018 p. 19). These concepts allow for being in the situation and reflecting while handling the unforeseen part and finding a way of resolving situations that may occur, while being ethically in tune and responsive to the people with whom one interacts. To become a skilful facilitator of co-design processes requires exercise, practising, and reflection through discussions with participants and the professionals involved. This may allow for flexibility and the possibility to change plans as the process develops (Morse et al., 2013; Rock et al., 2018; Stuedahl, 2018). Knowledge about how to conduct co-design processes builds on pedagogical training, but at the same time it is not always expressed in words so that the insight is made explicit. One must have practised co-design several times for this expertise to develop (Light and Akama, 2012; Nonaka et al., 2000).

Possibilities, challenges, and consequences have been central when looking for traces of dynamic knowledge production in this PhD project. In the process of becoming a professional, either as an architect or a science educator, it is important to reflect on our practice (Schön, 1987). Doris Ash takes this argument a step further when she states that reflective practices and critical thinking may empower educators and facilitators to create meaningful encounters. This reflexivity may be an instrument for opening up more diverse visitor populations, as well as to communicate back into the museum organisation (Ash, 2019).

2.7 Young people as collaborative design partners at the science museum

Children and young people are often considered a main visitor group for museums, whether they visit with families or as part of a school group. At the same time, their voice is rarely heard within the museum, except when they visit as part of a school class participating in an organised learning program that facilitates for dialogue and actions. Programmes that extend over time and are open-ended are not a characteristic of museums' provision for schools. While museums often consider young people as hard

to reach, teenagers can also be considered to be an ‘underserved’ group in museums (Achiam, 2019; DeWitt et al., 2019; Miles and Gibson, 2016). When teenagers enter the door of a museum, they are usually there as part of compulsory education and do not always take notice of the fact that they have been to a museum (Dawson, 2018). A part of the responsibility that museums and schools bear for educating the public and contributing to the formation of citizens is to strengthen and empower individuals and communities (Bennett, 2013; Hylland and Mangset, 2017). In the Norwegian context, to think critically and be environmentally conscious, to have co-responsibility and the right to involvement²⁹ is enshrined in the Norwegian school system, as well as the Education Act. The same applies to student participation, a new and essential part of the curriculum renewal of 2020. This addition reflects international trends in education policy and in children's rights.³⁰ According to a student representative, the difference is that now it is not enough that one is heard, one should have something to say in matters that concern oneself.³¹

Designing with young people and children can give us insights into what they like to do and what helps them learn. However, we cannot expect them to have insight into pedagogical tools and methods, or into which choices are necessary when one is responsible for the learning of 25 pupils (Druin, 2002). Nevertheless, students are exposed to a variety of learning activities and are often able to express what they like and describe learning situations that make them unhappy. In many ways, facilitating for activities within the context of a museum may be even further away from a young person’s experiential horizon. In the face of another spatiality with a proximity to objects and history, experiences from the school or home environment may need to be translated and negotiated (Guha et al., 2005; Fails et al., 2013). As part of this research project has been to organise, facilitate, implement and evaluate a workshop with children aged 10 to 13 years, I include some considerations about what one must be aware of when co-designing with children. Research on design processes with children uses methods of cooperative enquiry, where children and adults collaborate to find

²⁹ Curriculum aim of the education <https://www.udir.no/lk20/overordnet-del/formalet-med-opplaringen/>, date accessed, 07 October 2021.

³⁰ United nations convention of the right of the child: <https://www.savethechildren.net/united-nations-convention-rights-child>, date accessed, 07 October 2021.

³¹ Facts about Norwegian education, <https://www.udir.no/in-english/>, date accessed, 07 October 2021.

themes that need exploring (Guha et al., 2005). In such projects, children collaborate with the research team on a long-term basis, which is important for creating a safe space for dialogue. This contributes to children viewing the adults as their partners in designing technology.

At a science museum, much attention and energy go into designing and offering relevant pedagogical programmes. Nevertheless, the traditional way of developing learning activities is by testing the design rather than inviting the end-user to be part of the development process. These try-outs of activities do not influence how exhibitions and programs are conceptualised, rather they refine the outcomes. Giving the end-users a voice in design processes can lead to an increased understanding of how to develop learning activities in collaboration. Partaking in co-design processes for children and young people holds the potential to empower individuals in shaping technological development as well as enable critical reflection (Iversen et al., 2017). In line with teachers in schools, museums pedagogues can help prepare children for dealing with an unknown future and acting in a democracy and through that embrace plurality and difference (Biesta, 2015; Hodson, 2014).

Central to this is to trust the ability of young people. Children are immediate in their reactions, if they are bored or displeased, it will be visible and if they do not feel comfortable and safe, they will not take an active part in the process (Guha et al., 2005). Hence, to be aware of children and their often-visible reactions is necessary when planning, facilitating and analysing workshops with children. It is also necessary to provide opportunities for children to express themselves in different formats, talk with each participant, give opportunities for writing, and have time where there is nothing on the agenda. In other words, it is essential to have a flexible approach, and be ready to change plans if something unforeseen occurs. An element to be aware of is that during open dialogues that do not require agreement and consensus, young people with less self-confidence will easily think that everybody else's utterances are more valuable than their own, particularly if the group dynamic does not feel safe (Akama and Light, 2020; Katrikh, 2018). Vasiliki Tzibazi underlines the importance of trusting young people's ability if museums want them to participate in co-designing museum experiences (Tzibazi, 2013). This points back to letting go of control and valuing all knowledge, experiences and understanding equally. When involving youths as experts in co-designing a learning activity, there is a notable tension in how museums strive to be

relevant for youth without really giving them an arena to act (Stuedahl and Skåtun, 2018). A youth participatory process also increases the ability to build relations between the participants and with the institution. At its best, new friendships can arise and by working alongside peers, one gets to know each other better (Gibson and Kindon, 2013; Modest, 2013). This may also inspire museums to expand their school programmes to cover more than just pupil visits as part of their school education, to expand the number of visits and facilitate visits beyond school hours. When targeting groups of young people to participate in co-design processes, it is important for the museum not to interpret what the young people's interest and engagements are and expect that their attentiveness will resonate with the issues discussed (Dawson et al., 2020; Morse et al., 2013).

2.8 The co-design workshop as a boundary object

One can view co-design processes as making spaces where materiality, practice and social-cultural resources intersect, spaces that are in-between (Bratteteig and Wagner, 2016), where knowledge is developed through boundary crossing in making sense together (Vavoula and Mason, 2017). In a collaborative endeavour, each participant can be viewed as an important stakeholder, whose active agency must be acknowledged (Kumpulainen et al., 2018; Modest, 2013; Star, 1990; Tzibazi, 2013). Keeping in mind that museums today are facing new challenges, in the sense of being institutions relevant to a diverse population in a globalized world, which requires professionals to handle complex ethical issues, both when handling controversial themes and in participatory practices (Marstine et al., 2013; Pabst, 2016). From the very beginning, museums were formed at the intersection between professionals and enthusiastic non-professionals, a process described and discussed by Susan Leigh Star and James Giesemer in their influential article about 'boundary objects' in 1989 (Star and Griesemer, 1989), and later elaborated by Star (Leigh Star, 2010). Star and Giesemer analyse the establishment of the Natural History Museum in California to understand how collaboration between experts and non-experts or between amateurs and professionals emerges. Boundary objects, both from material and processual work arrangements have most often been associated with the characteristic of interpretive flexibility, moving between the realities of the different parties while at the same time retaining a stable core. A boundary object provides opportunities for dialogue, and when an object crosses a boundary, negotiations and articulations of viewpoints are

necessary; conversation becomes important (Hetland, 2020; Stuedahl, 2018). A focus on language is important when experts and non-experts are co-designing, acknowledging that there are jargons that can be perceived differently for people from the outside (Vavoula and Mason, 2017). This allows for diverse people with various sociocultural backgrounds to share common understandings, and yet still perceive things differently. Arranging and designing collaborative workshops and meetings where youths collaborate with museum professionals can be considered an orchestration of competences (Bratteteig and Stolterman 1997, cited in Vavoula and Mason, 2017). Like boundary objects, co-design workshops focus dialogues and negotiations of meaning among diverse partners and facilitate collaboration, while themselves meaning different things to these same diverse partners. It is important to allow for such new boundary objects to emerge, potentially taking the shape of new collaboratives and partnerships (Leigh Star, 2010).

2.9 Future Workshop Method (FW) and how it may work

There are several techniques and methods that can be used as a driving force in a co-design process, and when taking on a co-design endeavour it may be necessary to use several. Relevant methods can include drama techniques such as tell, make and enact (Brandt et al., 2012), or technology, immersion and low-tech prototyping (Vavoula and Sharples, 2007). Eva Brandt (2013) explains that the possibilities of enacting future scenarios will allow the participants to explore how a possible behaviour will proceed in an imaginable future (Messenbrink, 2018). An interesting entrance for creative problem solving is the Future Workshop Method (FW) (Jungk and Müllert, 1987; Muller and Kuhn, 1993). It was originally developed as a way of empowering citizens on societal issues and taking an active part in processes of democratic problem solving. The method empowers people who have little experience in creative processes, such as young people and children, and invites them to become visionaries and use their imagination (Vidal, 2005). In the Expand project Dagny Stuedahl uses FW to support pedagogical development among science centre professionals when re-designing processes of installations³². She concludes that FW supports an awareness related to the

³² <http://utvite.org/en/about/>. Expand is a model for science center research, where one component is to use Future Workshop as a structuring tool for processes of re-design of science center installations. date accessed, 25. October 2021.

design process, and helps to foster understanding of situated issues connected to a specific installation and find solutions to them (Stuedahl, 2017).

To dream about an imaginable future is rooted in being human (Freire, 2000; Vidal, 2005). All through history, individuals and groups have struggled for a better future, whether it has been about suffrage for women or better work conditions. FW has its origin in practice; it is about handling real life situations. It consists of four stages. First, there is the preparation phase, where the plan for the design and the task to be solved is given. This is followed by a critique phase, often through a brainstorming act of scrutinizing and framing a problem. Then comes a fantasy phase, where there are no constraints regarding possibilities and funding. The last phase is implementation, where the ideas are evaluated based on their practicability. One thing the methods mentioned here have in common is that they are all human-centred whether they aim to design a digital installation, an exhibition or a learning programme. There is a wide variety of tools and techniques when facilitating design processes and it is up to the design team to try to understand the process and support it, rather than following defined definitions. Another method is the Future Technology workshop, where the collaborative unit tries to envision how we might learn, use, play or work with ICT technology in the future. Similarly, to FW it does not require a lot of preparation, facilitates collaboration, gives direct input to design, and is open-ended and pragmatic (Vavoula and Sharples, 2007)

3. Project description

The SIB research project is a qualitative exploration of a participatory process of co-design within the NTM. As mentioned in the introduction, twenty-two individuals have been involved: eleven youths from the Grorud District Council, one external museums researcher, three museum professionals including myself, one master student in Museology, two museum explainers and four younger children. The research started in the autumn of 2016 and lasted until summer 2019. The study revolves around the temporary exhibition *FOLK* that opened in March 2018 and closed in December 2019 (for a more detailed description of *FOLK*, see Chapter 1).

Naturally, as the publications included in this thesis are standalone, there is some overlap in their descriptions of the project and this chapter of the thesis. Nevertheless, the purpose of this chapter is to look more closely at what occurred during the co-design processes and how it connected with, and shaped, my research aims and objectives. This chapter is structured as follows: first, I discuss the emergence of the need to co-design as a museum pedagogue, and the need to research my co-design practice. I will then focus on the SIB project as a co-design case study to look at how it was organised and arranged, including how we recruited the young co-designers, how we designed the workshops, what we planned for, what we intended to do and what emerged. I will connect project stages and points of departure from the original plan with the development of the research aims and objectives, which were, to a certain extent, also co-designed with my SIB partners.

I look forward to describe, analyze and discuss the case, after a report on how five pedagogical projects have shaped my understanding. Furthermore, the description and discussion will highlight what kind of impact the research project has had on how the museum thinks about participatory practises, dynamic knowledge creation, young people and as an inclusive and open space for interactions with humans and objects.

3.1 emergence of the need to research my co-design practice

Early on in my museum career, I collaborated with Rosenhof adult education, responsible for courses in Norwegian language and culture³³. In the late nineties we

³³ English page of Rosenhof adult Norwegian language courses: <https://rosenhof.oslovo.no/en/>, date accessed 10. November 2021.

developed and organised a course in ICT learning for adults with a short residence time in Norway, taking advantage of the museum's several Internet-connected computers, these kind of computers were not common in private homes at that time. In addition to overseeing developing and running of the educational programme at the Norwegian Telecom Museum, I was also responsible for internal training, recruitment of explainers and many other tasks which must be performed operating the exhibition area of a small museum.

This section elaborates on five pedagogical projects that I undertook subsequently to this, which shaped my understanding of the role of museums on an institutional level as well as part of society: the *Meeting Memory* project which engaged elderly people with dementia, *Friendship and love on the Internet and mobile phone* for pupils age 10-12, *Radioverket* making podcasts with high school students, the *Museum in prison* project which engaged Oslo prison inmates, and the project '*To and From the Youth*' – *Including Youth as Experts a design process* of which we engaged a group of eight youths from Save the Children (STC) network. In all of these projects, collaboration was essential both in development and as a feature of the programme itself. *Meeting memories, 2008-2013*: in collaboration with two museums in Oslo and health professionals from the Oslo district council, we developed a programme for people with dementia. Understanding the museum as a space for shaping identity, transforms the museum into a place where the visitor can encounter different exhibitions and objects they recognise and associate with different periods and events in life (Hooper-Greenhill, 1992; Hein, 2002). For me, being part of the journey of designing the programme, training programmes, arranging conferences on the theme and writing a handbook to guide similar work in our cross-disciplinary work community (Folge et al., 2011). This brought into focus issues of museum authority and the question of whose narrative is presented. In the face of many long-lived lives, it was natural to emphasises the experiences of the participants rather than tell the museum's narrative. The project is still active and during the pandemic the *Meeting Memories* training programme for health workers was arranged digitally.



Figure 6: Participant in Meeting Memories project at the Telecom museum, Copyright (2008): Cato Normann printed with permission.

Radioverket (2004-2013): In collaboration with my museum technician and web programmer colleague Tobias, and with an external media teacher, we designed a four-hour workshop in which participants learned how to create radio programmes - what would two decades later be known as podcasts, as they were digital audio file made available on the museum website. Radioverket ran for several years, we offered the workshop to high school students who were studying media and journalism. The students were tasked to create radio broadcasts, consisting of reading the news, radio-drama and “five on the street” vox-pop interviews. The podcast was then published on the museum web site. Later on, Tobias and I adapted this educational programme for inmates of the Oslo prison as part of The Museums in Prison programme (I will come back to this project later). Both Radioverket and The Museums in Prison programmes were structured as a combination of lectures, facilitated collaboration and self-produced content, resulting in multivalent perspectives and allowing participants to contribute based on their own particular strengths as learners.



Figure 7: Youth creating a radio programme that was broadcast through the museum website, Copyright: Cato Normann (2012), printed with permission.

Friendship and love on the Internet and mobile phone (2009-2012): The starting point of this project was the temporary exhibition and research program *Feelings in Flux 2009* (Bratland, Nina, 2009), which inspired the design process of this learning programme at the Norwegian Telecom Museum to creatively explore the possibilities and challenges of such virtual connections. A cross-disciplinary team Tobias, the curator of the *Feelings in Flux* exhibition Nina Bratland, the museum photographer and myself, the pedagogue, initiated a collaboration with STC. Our aim was to design an interactive programme that would encourage children to reflect on the challenges, strengths and weaknesses of developing both romantic relationships and friendships between people in the virtual world. Our ambition and hope were that a focus on the present would empower children in a future online world: a virtual world that will be part of their everyday lives in many ways.

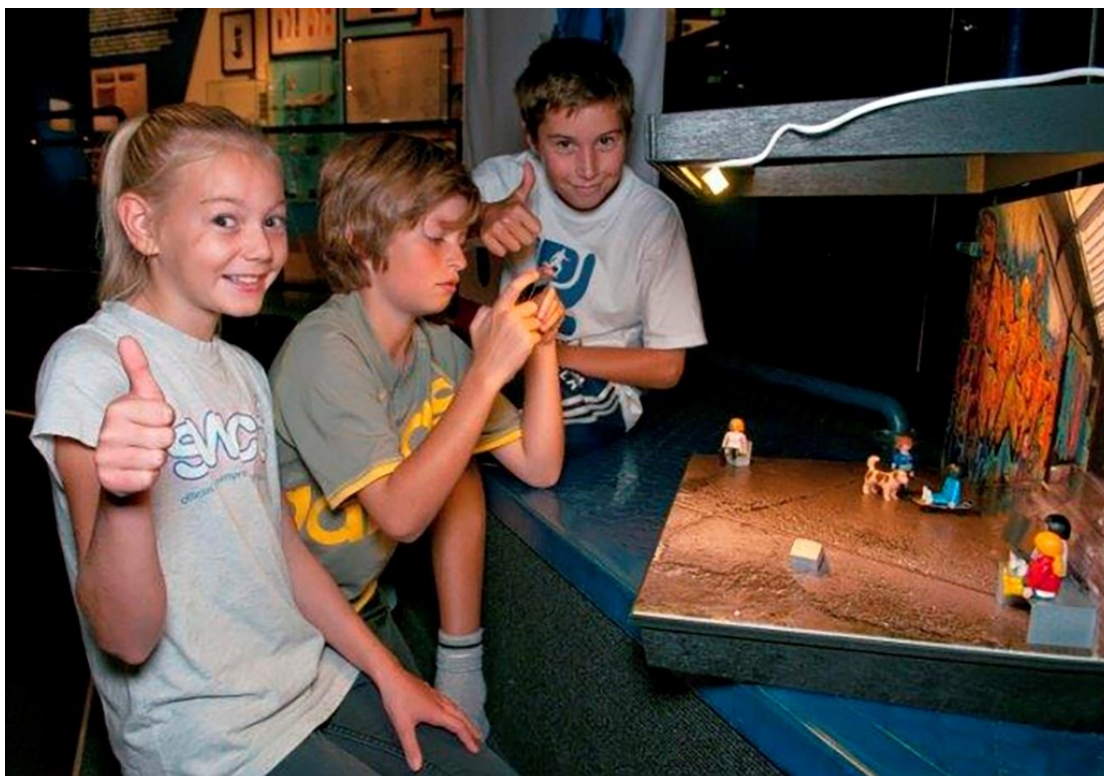


Figure 9: Students taking a picture of a scene created with plastic figures to represent an event in a school yard. Copyright: Cato Normann (2010), printed with permission

Our STC partner's expertise in the design of participatory processes with this age group increased our knowledge of children's behaviour on the Internet, as well as the challenges associated with it. STC refers to the UN Convention on the Rights of the Child, in that children have a right to speech when decisions influencing their lives are made. *Friendship* thus brought in different perspectives and experiences from non-museum professionals in the form of STC and its social commitment to empowering young people to navigate the online world with prudence.

Museums in prison project (2012-13) (Skåtun, 2014): This project, which underpinned my dissertation for the MA in Learning and Visitor Studies, investigated the potential of museum and prison collaboration. It explored how three Oslo-based museums adapted their learning programmes for inmates of the Oslo Prison³⁵. The collaboration included the prison school service, the Munch Museum, the Telecom Museum and NTM, and looked into how three museum learning programmes were transformed and adapted for inmates of Oslo prison.

³⁵ The museum in Prison project was initiated by the Norwegian Arts council, which arranged meetings and a seminar on digital storytelling for the museum professionals together with the prison's guards and school service.

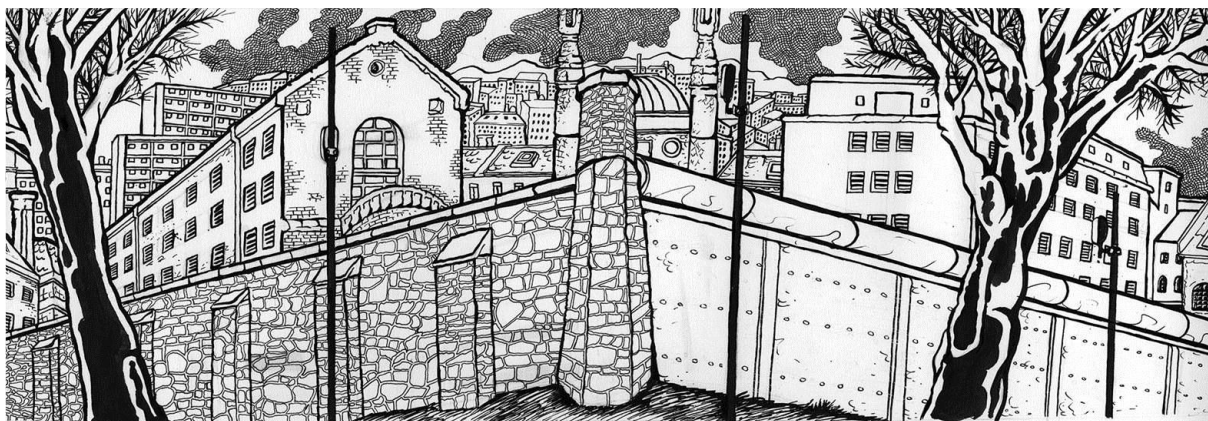


Figure 10: Drawing of Oslo Prison by cartoonist Christopher Nielsen, printed with permission.

One main aim of the project was to give the inmates a feeling of participating in society through attending the museums' learning activities. My personal research interest focused on whether participation in the Museums in prison project would have an impact on how the museum professionals viewed the role of museums in society.

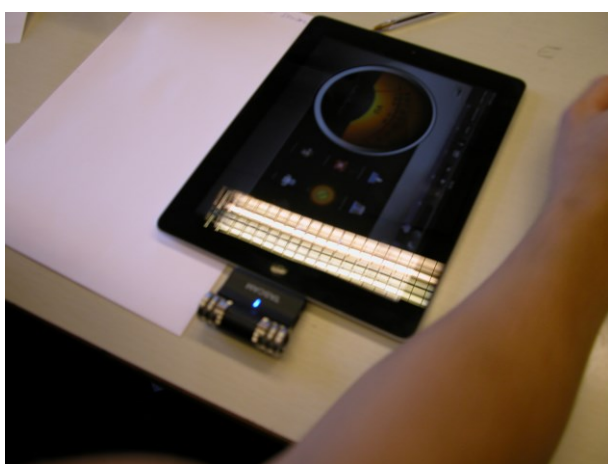


Figure 11: Inmates making a radio program in iPads within the bars of Oslo Prison, Copyright (2013): Tobias Messenbrink, printed with permission.

Two to three professionals participated from each museum, this helped us to share

experiences as well as to foster reflection among the museum educators. A project like this is very time-consuming and challenging, with many people involved and several unpredictable factors. As a collaboration between the museums and the prison school service, it demanded several committed persons as well as commitment from the museums' management. My research findings showed that the museum professionals found participating in the project beneficial in increasing their understanding of the museum's role in society, though social engagement was not that easy to implement in practice. The project's participants experienced the customisation of the learning programmes to be both meaningful and challenging; just by entering the doors of a prison, museum educators face many obstacles like permissions and restrictions on the equipment they were allowed to bring in. Nevertheless, the conversations that materialised through the collaborations were challenging but stimulating. Organising and facilitating the programmes behind prison bars, sharpened my, as well as my co-pedagogues', reflexive professionalism on how to understand museums in society through the adaptation of our learning programmes for unfamiliar environments as the binding task (Silverman, 2009).

Including Youth as Experts (2014-15) (Stuedahl and Skåtun, 2018a). This project was closely connected to the exhibition *Things – Technology & Democracy (2014-15)*³⁶ and was a collaboration between STC, NTM, the Norwegian Telecom Museum, and academic museum researcher Dagny Stuedahl. Inspired by digital storytelling,³⁷ we explored tablets as a tool for shaping an educational programme within a museum setting. Eight youths from 16 to 18 years were recruited from STC networks and we facilitated five workshops during the winter of 2014/15. Dagny and I wrote together about our experience (Stuedahl and Skåtun, 2018) and concluded that collaborative methods can contribute to connect the museum more closely to society as a whole. Furthermore, we argued how digital media, in this case iPads can be central to facilitating for mutual relationships and supporting reflexivity on complex social issues within the frame of the museum's space. As pointed to in the title, we had the perspective of viewing the young people as experts in their own life; being young and

³⁶ *Things – Technology & Democracy* explored the complicated relationship between technology and democracy, focusing on eight specific museum objects as starting points for the reflection (Rasch & Treimo 2014)

³⁷ Digital storytelling reflects to an affective and personal story around a specific topic (Lundby, 2008)

young learners. STC emphasises this element, as they have long experience working closely with young people.



Figure 12: Four young people from STC network discussing opposite pairs like anonymity and openness connected to the overall themes' technology and democracy. Copyright, Nina Bratland (2015): printed with permission.

Gunnar Taxen (2005) argues that participatory design involves designing *with* the users and not *for* them. In a museum context, the starting point is often the museum collection; in our project, a shift of perspective put the potential student and learner as point of departure of the design process. We searched for artefacts and collected stories of online interactions that lent themselves to reflection on being human today (Black, 2012; Sandell, 2016; Simon, 2016; Stuedahl et al., 2021). We wanted to facilitate a programme that would empower learners to handle future challenges in life by focusing on interpretation and reflection through participation and interaction. Nanna Holdgaard and Dagny Stuedahl (2021) use the same series of workshops for a discussion on participatory design, they conclude that design processes that forge closer ties with participants give opportunities to become better acquainted with how the museum is perceived among a given user group. However, these processes meet the same challenges regarding clarification of roles and negotiations of authority as other PD projects do.

The SIB project follows as a continuation of the tradition of PD (Taxén, 2004) that took place in the projects I presented above, but adds more stakeholders including exhibition curators, technicians, as well as young participants. Collaborating with external partners who bring their own agendas and perspectives can expand the project's overall outlook (Graham, 2016). SIB also takes the collaboration a step further, in providing a closer dialogue between all participants during the development of the *FOLK* exhibition. Additionally, by exploring longitudinal partnership in collaborating on arranging a workshop for children, gave opportunities to better understand the aftereffect for a young person who participated in the SIB co-design process.

Another important feature of most of the programmes I discussed above was the active use of digital tools as a way of tailoring the learning experience. Digital formats can support museum experiences in a flexible and creative way, by staging learning and engagement experiences that are interactive and elaborative (Drotner and Erstad, 2014; Parry, 2007; Pruulmann-Vengerfeldt and Meyer zu Hörste, 2020).

3.2 SIB co-design 2016 – 2020

SIB unfolded in two phases, where the first phase involved co-designing a digital installation for the *FOLK* exhibition called *The Sound of FOLK*. This phase lasted from December 2016 until the exhibition opened in mid-March 2018. Phase two started a year later, in December 2019, and involved me working with the external research partner, Dagny Stuedahl, and two of our co-designers from phase one, Stephen Ravi and Shukran Kaakal whom I had asked to be lead facilitators of a workshop with younger children, applying their learnings from our earlier co-design activities in phase one. Together we planned, conducted, and reflected on a co-design workshop with young children. The aim of this second phase of co-design was to understand what participants learn from the processes, how they internalise the learning and how they apply their knowledge in a new situation. Figure 13 below presents a schematic representation of how *FOLK* and SIB related. Both phase one and two are described and discussed in the academic and professional papers as well as reflected upon in the podcast included in this thesis. The design of the *FOLK* exhibition run in parallel with the SIB co-design project, with the two feeding into each other. Three museum staff, Tobias, Ageliki and me, were members of both the *FOLK* exhibition and the SIB co-design teams. The SIB co-design team included members of the Grorud youth council, highlighted with a rectangle and added with two young men, whom took part in both phases. Represented

in one green and one orange figure carried on into phase two to co-design a learning programme for *FOLK* with four younger children.

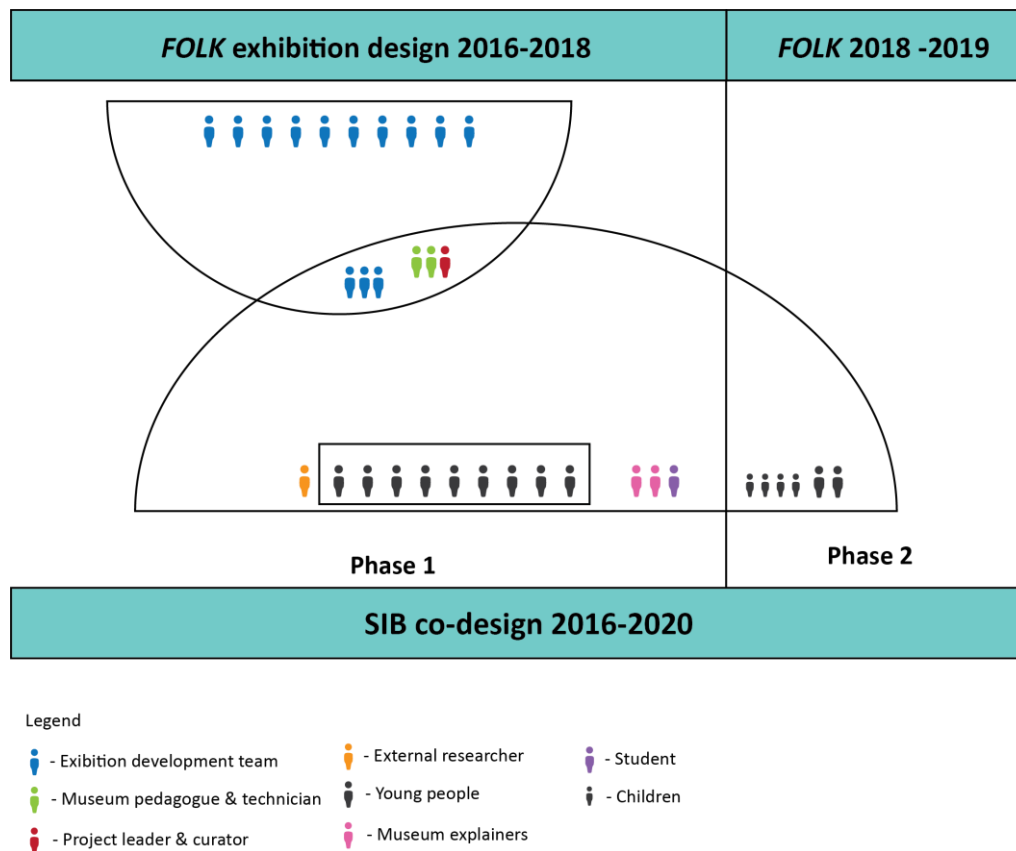


Figure 13: SIB co-design timeframe and presentation of the persons involved, ill: Shahzia Vira

Before I start describing SIB step by step, let me first reiterate how my research questions map onto the narration of the process. For the first question, “How do co-design processes transform the museum into a space for dialogical interactions between experts and non-experts?”, museum professionals have worked alongside young people through workshops and meetings for more than two years. In this experimental and social space, we have facilitated dialogue and collaborative investigation that spans age groups, contexts, skills and knowledge. There was reciprocity between being open and keeping a steady way forward, and our work impacted the curation of the *FOLK* exhibition and, in a broader sense, the NTM. The second question, “How does co-design in a science museum impact, and in turn is impacted by, knowledge creation processes at both individual and organisational levels?” directly maps onto the co-design processes that we implemented, focusing on mutual learning and equality and leading to a changed understanding of learning and experience within a museum space.

Finally the third research question, “How can co-design affect the way that a science museum understands itself as an active agent in young peoples’ learning and engagement?” maps onto the open-ended feature of the actions and dialogues in a collaborative adventure that is recognized as more long lasting and equal.

3.3 Recruiting participants from Grorud Youth Council

All city boroughs in Oslo have a youth advisory board that comprises residents from the ages of 12 to 18, as do all municipalities and counties around the country. This is enacted by the government and is mandatory and enshrined in law. All decision areas that have an impact on young people’s lives will be presented to the youth council, who have a say in and effect on the decision-making processes.³⁸ The Grorud Youth Council is an active and dynamic group of young people with several engagements, meeting on a Tuesday once a month. Beyond their involvement in matters affecting young people in their district, the Grorud Youth Council also organises a biannual conference on youth participation. During the time we collaborated, they organised a torchlight procession and ran a petition in support of a music workshop for youth threatened with closure due to lack of financial support from the city council. They won this fight. In one of the interviews, I was told how the youth group had negotiated their payment.

One of the reasons Grorud Youth Council is working so well, is that we are the best paid youth council in Oslo.... Because it is about knowing your rights, the other youth councils most often are paid less than other groups of representatives of the district councils (Catharina³⁹, 19 years).

As SIB was taking place in the context of the *FOLK* exhibition, which addressed issues of racism and racial discrimination due to false historical science premises, we started to search for co-designers by approaching NGOs that had a special engagement in fighting against racism in society. In Norway, such organisations include The Norwegian Centre against Racism, and Press, STC’s youth organisation. However, their members are mainly young adults, which did not fit our target audience of high school students, as we aimed at developing a learning program for this age group. With help from STC and

³⁸ A guide to local democracy, on the Norwegian Government home page, states that all municipalities shall have a youth council: <https://www.regjeringen.no/no/tema/kommuner-og-regioner/kommunereform/Verktoy/lokaldemokrati/veilederen/kommunen-og-innbyggerne/ungdomsrad/id2425384/> date accessed, 26. October 2021.

³⁹ Not her real name

their network, I contacted the organisation Youths and Leisure Time, who organise all the youth clubs in Norway and are responsible for training young people in writing applications for funding, project development, citizenship understanding, and participation in youth advisory boards. Youths and Leisure Time put me in contact with the borough of Grorud's official who is responsible for all youth activities in the council and who, in their gatekeeper role, facilitated the recruitment of Grorud youth advisory board members for the SIB project.

3.4 SIB Phase 1: Co-designing the Sound of *FOLK* (Mar 2017–Mar 2018)

The first phase of SIB focused on co-designing the interactive exhibit *The Sound of FOLK*, which formed part of the *FOLK* exhibition. Through all the workshops leading up to the sound of *FOLK*, two young people recruited through Grorud Youth Council attended all, while a revolving cast of nine more young people attended between one and several workshops each. Our co-designers also had other engagements, and even though we steered clear of their council meetings when scheduling the workshops, many had jobs after school hours, in grocery stores and as homework helpers. I perceive the individuals in our group as resourceful youths, their place in the youth council being the result of their involvement in political parties or as student council representatives in their schools.

The museum team – which as mentioned earlier in the thesis, this included curator Ageliki, museology researcher Dagny, sound engineer and MSc student Tobias, and myself the pedagogue – had made some initial choices to frame the co-design activity before we met the group of young people for the first time. We knew, for example, that we would like to explore the possibilities that a co-designed digital exhibit could provide. Furthermore, Tobias's background as sound engineer and the team's prior experience in including the creation of podcasts in educational programmes for high school students, led us to decide to use sound as the main media for the co-designed exhibit. Additionally, GDPR⁴⁰ guidelines that were coming into effect shortly would

⁴⁰ The General Data Protection Regulation, was agreed upon in the European Parliament and Council in April 2016. With its strong attention on individual consent when publishing images in a public space, we chose the sound media. https://ec.europa.eu/info/law/law-topic/data-protection_en, date accessed 26. October 2021

complicate the use of images, and sound appealed to us as easier to navigate in terms of GDPR.

Phase 1 included eight co-design workshops. I discuss these in two subgroups, as the first four workshops were exploratory in nature and served to build the co-design partnership with the young people and to explore the context of our work; whereas the last four were more structured using the Future Workshop method (Jungk and Müllert, 1987a; Vidal, 2005a) and geared towards our exhibit design.

Before the very first workshop, we invited the young people using email and text messages (see Appendix 1). The museum team used this invitation to describe the co-design as a creative project looking into the possibility of making a learning activity that would facilitate for the participant to discuss and reflect on the *FOLK* themes, emphasising that everyone will bring in different perspectives and play a significant role in generating knowledge. In the letter we explained that we were looking for up to ten young people to be our co-designers and we offered a payment for each three-hour workshop of 500 NOK (~44 GBP). The first four workshops had a similar structure: they were scheduled after school and after museum opening hours, starting at 5 pm, and lasted approximately three hours each. Each workshop started by serving food and having an informal discussion while waiting for everyone to arrive. The workshop activities would then begin, with all our co-designers gathered in a plenary session with lectures or discussion followed by a practical task and concluding dialogues.

Encouraged by the Youth Council Secretary, who had told me that Facebook had been the best channel for communication with the young people for Council work, we set up a closed Facebook group⁴¹ called *Science, Identity and Belonging*. In this group we shared information concerning the workshops and about the themes of our work, polled our co-designers to identify mutually convenient times for work, reminded partners of the tasks we had been asked to complete before the next workshop, and published three films of the suggested sound installations. However, and despite the council secretary's advice, we soon discovered that no one really read the Facebook posts – when I asked why the Facebook updates did not reach them, their answer was that they did not use Facebook often and group updates tended to be lost among dozens of other updates. I,

⁴¹ A closed Facebook group allows only those who are part of the group to see, share and post pictures, texts and polls. In our group there were 20 members: the SIB team, the young people, the youth council secretary, two museum explainers and a museology student.

therefore, started sending text message reminders to all participants for every new post and workshop. This increased the number of participants who came to subsequent workshops and had some impact on the volume of activity in the Facebook group, as a message sent directly to a mobile phone is something one has to act on. Even though activity in the Facebook group had to be prompted by a direct text message, it still worked as a place that everyone could access and where they could easily interact with the museum and each other.

The first workshop took place on the 21st of March, 2017. Our primary goal for the first workshop was to get to know one another and introduce the theme of *FOLK* and the collaborative work in front of us. In the plan for the workshop, I had made a note that it would be important to clarify expectations. Doing so is important because allowing people to express their expectations is also a manner of creating a space for mutually reciprocal interactions and communication (Simon, 2016b). The articulation of expectations contributes to a safe environment for sharing thoughts and actions, which further safeguards the participants in co-design processes and other forms of participatory action research projects (Rosten et al., 2021). It was also important to make clear that the workshop would be semi-structured and open to changes with adjustments decided by the group. In order to establish trust, I emphasised the fact that this participation should not be tokenistic and that the views and interests of our partners were to shape the direction of the project as much as the views and interests of the museum staff (Arnstein, 1969; Mygind et al., 2015a; Simon, 2010b). Eight young people from the Grorud Youth Council came to the first workshop, in addition to a friend of one of the eight. There were three girls and six boys, ages spanning from 15 to 19. Our invitation suggested we would all have pizza together at 5 o'clock; the first partner arrived fifteen minutes earlier, and the last one arrived at half past five. As a result, our schedule deviated from our original plan in this first meeting, something that continued to happen routinely throughout the project and meant that we had to revise our original plan for three-hour workshops and adjust the activities to fit in two and a half hours.

The museum team arranged for sharing food in the museum foyer, where we could keep an eye on the door for the arrival of co-designers and introduce ourselves and our various professional backgrounds and interests in the co-design project. It became obvious that the group we were meeting knew one another less well than we had expected. They went to different schools and were of different ages. Some had senior

experience as youth representatives and others were beginners. Language was a challenge, as pointed out by one of the older partners, in that some of the language we (the museum team) were using went over the heads of the youngest participants – for example, we struggled a bit to concretize and probably used too many unknown words describing how a museum can be understood in society, and likewise the historical factors connected to the topic of *FOLK*. We also shifted and translated between English and Norwegian to facilitate the participation of Ageliki, who at that time spoke only English.

When everyone had arrived, we moved to the museum LAB area. We continued by presenting the exhibition and introducing the terms ‘identity’, ‘belonging’ and ‘ethnicity’. The session started with a free association brainstorming around these terms followed: we all noted down words that are commonly associated with these terms, like home, passport, how I look and upbringing; as well as other words and phrases that we personally associated with the terms, such as memory, safety, borders, Norwegian, excluded, colour and belief. We noted these words on a brown paper roll with areas corresponding to the three terms. The co-designers experienced the task as easy to grasp and complete. With no illusions of this being sufficient to level our relationship with the young people, we still thought that all of us in the museum team performing the same tasks as our partners would strengthen our relationship and contribute to our understanding of each other’s perspectives. As Smith and Iversen (2014) explain, viewing everyone as experts in their own life is an important feature in co-design processes. By performing the same tasks as our young co-designers, the museum team showed through equal deeds that we trust the abilities of youth (Tzibazi, 2013b). Such joint actions can help to shift the focus from the museum as the ‘teacher’ and rather add strength to the care perspective (Morse, 2020).



Figure 14: SIB co-designers brainstorming terms associated with the concepts of ethnicity, belonging and identity on a brown paper roll. Copyright Tobias Messenbrink (2017), printed with permission.

After twenty minutes of personal reflection and noting down relevant ideas, Ageliki took us all to the medical exhibition, which is exhibited one floor down. The exhibition is called *Get Well* and is about life at the hospital from a variety of perspectives. Among the sound installations, visitors can listen to sounds from a hospital such as from the hallways, operating rooms, the intensive care unit and so on. We visited this exhibition to show our young co-designers an example of how sound can work in a museum exhibition. Listening to sounds from a hospital as a group broke up the intensive personal reflection activity and simultaneously allowed our new partners to acquaint themselves with some of the museum galleries. Subsequently, we moved back to the LAB and began to discuss the concepts we had written down during the reflective activity and our thoughts about the given terms. We organised it so that each of us could mark on a scale from zero to five how meaningful we found a word or phrase that had been noted down, with five being the most personally meaningful. We then averaged the marks given to all of the words and phrases on the paper, *upbringing*, *how I look*, and *culture* each had an average mark of five as shown in figure 14.

<i>Ethnicity</i>					
0	1	2	3	4	5
Believe	Growing up	Tribe	Culture	Part of one's identity	Upbringing
<i>Belonging</i>					
0	1	2	3	4	5
Excluded	residence	How one as a person feels	Home	Value	Culture
<i>Identity</i>					
0	1	2	3	4	
Personality	Self-description	Environment	Background	How I look	

Figure 15: In the second round of marking key words connected to *Ethnicity*, where 'upbringing' got five marks, culture connects to *Belonging* by five marks and How I look to *Identity*. Ill. Torhild Skåtun

The young people seemed to be enthusiastic about us creating something together, though what was being created was still very open.

It was a little strange in the beginning that it was somehow loose. You didn't know, you had an idea, but this was somehow fine for us and very exciting. I experienced that a dialogue and conversation came out of it. (Catharina, 19 years)

Moreover, how the young people pictured the end-result was at this point probably very different to how the museum team imagined it. In a way, I had the impression that they thought that our group were the ones making the whole of the *FOLK* exhibition rather than only one element of it.

Towards the end of the workshop the museum team introduced sound as the media of choice for our design work. This did not provoke an immediate enthusiasm among our co-designers who appeared rather reluctant. We also sought their advice on how to go forward in the next workshop, and the feedback was for us to continue in the same way. We ended the workshop by assigning homework to the whole team: everybody was to record a sound illustrating their everyday life on their mobile phone and bring it to the next workshop. This briefing happened a little too hurriedly just before the session broke up and we all left.

The second workshop took place on the 18th of April 2017. A couple of days earlier Tobias had posted a reminder in our closed Facebook group that everybody, including

the museum professionals, should bring a sound from their everyday life. For the second workshop, seven young people turned up, three of whom were new: two brothers who had an Albanian background brought an Albanian friend; two council representatives who had been prevented from participating in the first workshop also came. At the same time, we lost 5 of the young people from the first workshop. With three newcomers, we had to use some of the second workshop's time to summarise the previous workshop and explain the SIB project, what we were creating together, the exhibition theme, the usage of digital tools and the aspects of facilitating activities that supported cooperation.

After acclimating the newcomers, we began the second workshop by repeating the themes 'Identity, belonging and ethnicity'. Everybody was handed sheets with the associated words/phrases and their marks from the previous workshop. One partner noted that associations connected to the terms 'ethnicity' and 'belonging' were similar, while some of the words fit under more than one category. Another commented that the meaning of several words connected to the term ethnicity was in many ways the same and that they could be merged, such as a person's background, upbringing, and culture. This discussion brought us closer to the topic of the *FOLK* exhibition and gave space to our young partners to further reflect on this topic.

The next step was to focus on the Science History part of the exhibition content. Curator Ageliki introduced the background for the *FOLK* exhibition, explaining that it was part of research on how scientific exploration of race from the Enlightenment period onwards had contributed to understandings of biological differences today. She also explained how we wished to discuss several examples of contemporary genetic research as well as historical race science. She used objects like a tool for skull measurements and photographs of contemporary researchers exploring the Sámi population in the 1920s. The young people expressed that they knew little about these issues, and they had no recall of it being a part of history lessons at school. What generated the most interest was the DNA test kit from the company "23 and me". Here the conversation ran with enthusiasm among the young people, even if we tried to tone the test-kit down by clarifying the commercial interest and its resemblance to previous times' biological race science, as the DNA test-kit too was looking for differences and demarcations.

Nevertheless, it sparked real curiosity; one young woman stated that it feels as samples are taken of your own saliva, you become sure that it really is yourself. This conversation led to curator Ageliki seeing the need to exhibit the DNA kit; regardless of

agreement or disagreement with the reasoning behind such kits, it obviously stimulated debate. This was the first instance where co-design work that took place within SIB spilled over to the *FOLK* exhibition design, through one of the joint members. In our discussions with the young people we emphasised that the interpretation of an object does not include a single right or wrong characterisation; instead, it is important for us to recognise and value all reflections as essential to the conversation (Dawson, 2018; DeWitt et al., 2019; Feinstein and Meshoulam, 2014; Winstanley, 2018).

The next task was to listen through the sounds that two of our co-designers had recorded on their phones: a school music concert rehearsal and the sound of a heat pump. We talked about how sound also could be understood as a narrative, emphasising, for example, the memories and stories that the sounds from the rehearsal could embody. Recordings from a Greek mass and the sound from a marked square in Iran were shared by the museum professionals, and these contributed to us all becoming sensitised to the sound medium. Among other things, it sparked a conversation about how sound can create pictures in one's head, functioning as a meaningful media that allows interpretations while still providing hints for one to recognise and perceive elements of the world.

The final activity of the workshop involved the young people working in small groups of two or three, to sketch a sound story. As we had not focused that clearly on the term's identity, belonging and ethnicity during the conversations revolving around the audio recordings, we did so now: the task was to put together a storyline of an audio-story with the given terms as a starting point. Our homework this time was to surf for sounds that could be used to tell the story that our small group planned for.

After the workshop, I wrote the following in my notes:

It feels a bit like we have initiated a process where there is a combination of release for everyone's reflections and thoughts, along with holding a steady course. This is a trial, it is expected and yet challenging.

This combination of keeping the process stable and predictable while being open to change and evolution can cause situations that are messy. In such situations, it is easy to resort to giving new tasks for fear of silence or the opposite, for fear of too much talk, which in turn can lead to fragmentation and shallowness. The balance is very fine, between being flexible and planning along the way, as well as remaining patient and

enduring situations that are a bit out of control (Graham, 2016; Morse, 2020; Simonsen and Robertson, 2012).

I also noted after the second workshop that there were several collaborations, dialogues and interactions going on in parallel: between the museum professionals as well as with the young co-designers, and between the young people. Along these lines of negotiations, translations and actions, several small and big decisions were made that impacted the outcome of the co-design process as well as the collaborative climate within the group (Bratteteig and Wagner, 2016; Holdgaard and Stuedahl, 2021).

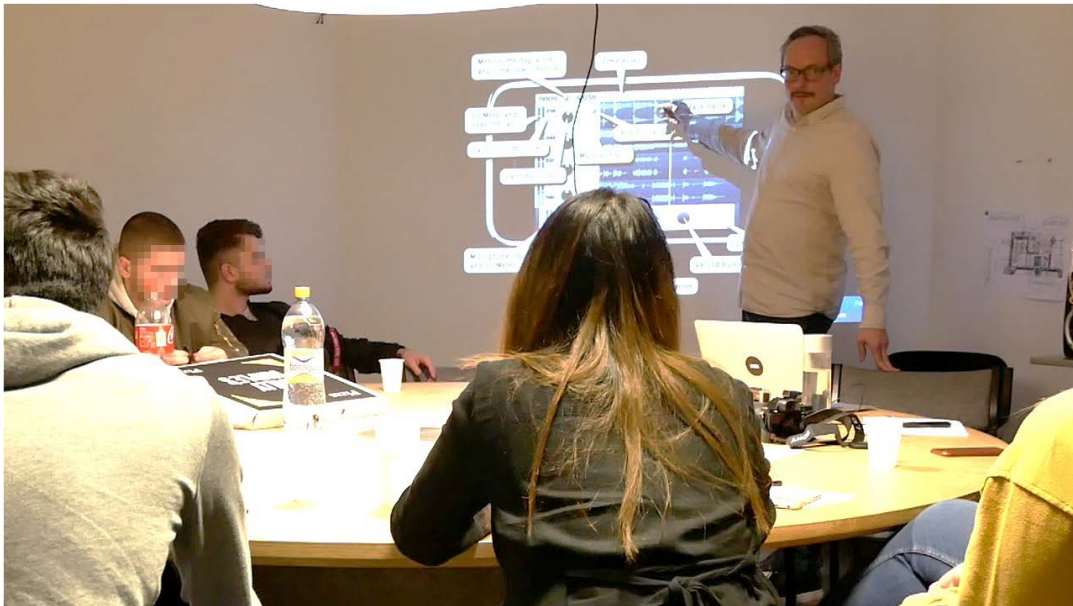


Figure 16: Tobias, explaining an app for audio editing to our co-designers at one of the exploratory workshops, (Still-image from action camera used for documenting).

The **third workshop** took place on the 15th of May, 2017. As in the previous workshops, not everyone was present before half past five, despite a reminder having been sent by text before the meeting, pointing to a new note in our closed Facebook group and giving the time and date of the workshop. That the note was supported by a text message helped, and this time nine members turned up and one messaged that he had an exam the next day. This time three had not participated in the second workshop but had taken part in the first one. They were assigned to two of the groups from the previous session so as to achieve numerical balance.

Two of the groups came prepared, one having had several sounds recorded and the other having downloaded sounds to their computer, and all three groups managed to make a story, whether they had prepared material in advance or not. The stories related to life from birth to death, words that turned into a conflict and then a war, and how an

ordinary day in life stretches out.

At this point, our young co-designer's creativity overtook the focus on race science. We found that it was difficult to explicitly link the perspective of science onto the stories, and already at start-up concepts and designations were chosen that resonated with the life world of our co-designers. Nevertheless, it was clear that there was a subtext, something I will return to. One of our co-designers described the task in an interview afterwards:

And then we made a sound-film. We showed processes in life, for example church bells ringing representing a child that was born or that someone had died. Life cycle. (Sahel, 17 years)



Figure 17: Co-designers, composing a sound story on an iPad. (Still-image from action camera used for documenting).

In many ways, the stories indirectly capture perspectives on belonging, identity and ethnicity in lived human lives in Norway and around the world, by pointing out that we are all born and will all die someday, no matter where we live or who we are. In another story, the narrative began from when one got up in the morning to when one came to school, including sounds of an alarm clock, toothbrush, subways and doors opening and closing. This also points out similarities in human lives, despite differences in where one lives or their upbringing. In a way we were fairly impressed by the result that the groups produced, given how difficult the theme was and the quite abstract means of expression that sound can represent.

In order to explore if voices could be added to the sound and how to connect the story more closely with the museum collection, we set out to experiment with pictures from the collection and see how these could be connected to making stories with words. We therefore ended the workshop by setting ourselves homework, to take a photograph of an object from the exhibition material using their mobile phones and then use it to record a one-minute personal reflection on *‘how do you relate the concepts we have talked about (science, belonging, identity and ethnicity) to this object?’*. We would have to send our recordings to Tobias in advance of the next workshop. My personal impression at the end of the workshop was that the task given was a little chaotic and unclear. Time ran out, therefore, we tried to make the task more explicit through representing and clarifying it in our closed Facebook group, with a reminder on SMS.

The recurring late comings and lack of solid preparations from our young co-designers led to a discussion among us in the museum team about what motivated our partners. As one of the partners told us later “you didn’t really know where you were going”. Thus, we decided that to be strict on meeting time and homework would change the co-design environment, resembling more a teacher-pupil relationship rather than empowering the individual to handle the creative process. Also, we had to acknowledge the fact that the openness of the process left our co-designers unclear as to where the process was leading (Brandt et al., 2012; Rogers, 2011; Sandholdt and Achiam, 2018; Stuedahl and Skåtun, 2018). Something else had to change.

The **fourth workshop**, the final in the first set of workshops in phase 1, took place on the 13th of June, 2017. This time six participants came to the workshop, only one of whom had submitted a sound file to Tobias. Together we listened to the story, which connected to a picture of the scientist Kristine Bonnevie⁴², active in the 1920s writing on her typewriter outdoors in front of what could be associated with a mountain cabin. The young man’s story placed his own grandmother in the picture, telling a story about typing connected to technology and his home country. He linked his own family stories to a historical photograph, not unlike what many people do when encountering museum

⁴² Kristine Bonnevie was a zoologist and Norway first female professor. She was director of the Department of Heredity Research from 1916, a time when human genetic was strongly interweaved with eugenics – see Kyllingstad 2018
(<https://www.uio.no/english/research/news-and-events/events/guest-lectures-seminars/science-studies/jon-kyllingstad.html>)

objects and images (Dindler et al., 2010).

Despite having what we had thought would be a thorough plan for the workshop, the fact that the young co-designers only brought in one story meant that we had little material to prompt and facilitate a dialogue and experiment with sound and text during the workshop. Therefore, we improvised around objects, photographs, stories, and sound. We noticed that mainly photographs depicting people were chosen, and only one was of a chart.



Figure 18: Kristine Bonnevie typing outside her cabin in the Norwegian mountains in 1931. Photo: Museum for University History, University of Oslo, unknown photographer. Printed with permission.

We all sat in silence writing our own rough draft of a story around SIB based on photographs we chose individually, then I started by reading aloud my text and the others followed. After each reading Ageliki elaborated on the content of the photograph, and we had a conversation about the images. Although this activity was an experiment and, in many ways, became a side-track from the development of the sound installation, it forced us to talk and reflect together as a whole group of museum professionals and young people together, on issues related to SIB. This turned out to be a bit tiring for some, as the quote below illustrates:

We were taught like to reflect more than we are used to, so sometimes I got like

headache, am I supposed to answer? I think it strengthened my ability to reflect (Shukran, 20 years)

We experienced the workshop as not very successful, as the conversations were somehow imposed, possibly due to the changes of plans and maybe because our co-designers were tired after a period of many exams. After the workshop, the museum team asked ourselves if our co-designers were just providing the answers they thought we expected to hear, or if their reflexivity really was strengthened with this exercise. My prior experience suggested that co-designers quickly fall into a pupil role when I take the lead facilitator role, as it resembles a teacher leading pedagogical activities in a classroom. This is something I think one has to take into consideration while organising for co-design endeavours, and one must provide methods and tools that balances the relationships (Modest, 2013; Tzibazi, 2013). Another factor for what we perceived as dis-engagement, may be that several weeks passed between each workshop. This was a bit unfortunate, and as one of the young people pointed out; a lot happens in a young person's life in a few weeks and then it takes some time to get back on track. Nevertheless, the fourth workshop gave us the opportunity as a group to engage with authentic museum objects, to scrutinise them, and to re-imagine the stories they tell. This collaborative object-based learning (Falk and Dierking, 2000; Hooper-Greenhill, 1999; Kieding and Sonne, 2021) must have brought the SIB themes closer to the whole of the team, including our young co-designers.

After this first series of workshops, we realised that we had not come as far in creating the digital activity that we had set out to do through the co-design process. While the experiments with space, objects, sound, and digital tools that we had undertaken supported our relationship with the young people as well as sensitising us towards sound as a medium for creative interactions and with the themes and topics that SIB negotiated, the opening of the *FOLK* exhibition was nevertheless approaching, and we needed to become more focused on a design outcome. The exact shape of that outcome – would it be a planned educational programme or an activity for all visitors to participate in? – was still unclear, and I felt that we needed a more structured approach to go forward. After turning to literature on co-design methods, I came across the Future Workshop (FW) method developed in the 1970s by Robert Jungk, Ruediger Lutz and Norbert Müller to find solutions for societal issues (Alminde and Warming, 2020; Jungk and Müllert, 1987). Empowerment and social learning are essential in this more than

50-years-old method. FW is based on participation in democratic decisions as an emancipatory process aimed at solving local problems (Vidal, 2005). This is a structured workshop method that takes participants through four phases, to search for new ideas or solutions to specific problems:

- a phase of preparation, where the purpose and structure of the workshop is presented to participants
- a critique phase, where the problem is analysed
- a fantasy phase, where participants envision solutions, and
- an realisation and implementation phase, where the envisioned solution is put into action

After discussing this method with my collaborators Ageliki, Tobias and Dagny, we decided to use it in the second round of workshops in the autumn of 2017. We drew on Dagny's experience in using FW to scaffold a process with science centre educators that helped to find solutions to situated problems (Stuedahl, 2017). Reinforcement of Dagny's experience came from Tobias, who had taken courses on Participatory Design at the institute of Informatics at the University of Oslo about how FW can facilitate for processes that generate ideas (Messenbrink, 2018; Taxén, 2004).

However, our challenge was that there were no clear problems to solve, neither for us as museum professionals nor for the participants, other than a search for new museum experience, unknown to us all, activity that supported and expanded the issues raised by the *FOLK* exhibition. The critique phase in our case was tailored to realising creativity connected to how museum activities may be staged within the museum space and how it could feed into the fantasy phase. This envisioning of future solutions is likely to generate new innovative ideas, although we have to keep in mind that FW does not always lead to change (Alminde and Warming, 2020). Our approach was to create a mutual understanding of the sound medium and of ways to understand a museum experience. FW provided a shared design space where all participants' opinions and values were recognised and valued, orchestrating a process that included potential users of the outcome (Taxén, 2004; Van der Velden et al., 2014). We therefore expanded the critique phase to identifying problems, to facilitate for a dialogue around identifying pros and cons in a museum experience (Messenbrink, 2018).

Several of our young co-designers were coming to the end of their engagement as advisors for the Grorud youth council as they were about to start university elsewhere or go into employment, and new young people would be appointed later in the autumn. Meanwhile, the *FOLK* exhibition was less than 12 months from opening, and we would have to resume our co-design work as soon after the summer break as possible. Therefore, we looked to our own networks to recruit three more young people to the SIB team. Three were students from the University of Oslo whereof two worked in the science museum as explainers during weekends and one was studying for a Masters degree in museology, were recruited. As our plan was to conduct a series of Future Workshops in the autumn, we were anxious about having enough SIB members to create a series of scenarios.

The first four workshops, we define as having already fulfilled the Future Workshop's preparation phase because we had explored the sound medium, exhibition spaces, the topics of *FOLK* (identity, ethnicity and belonging), looked into museum objects and historical photos and made connections between these. We therefore started the **fifth workshop**, which took place on the 19th of September 2017, with FW's critique and problem identification phase. In order to reinforce the group's knowledge of what an exhibition is and what exhibition interactives look like, but also to identify critique points, we analysed the exhibition *Typical* and the interactive activities that it facilitated, at the Intercultural Museum (IKM) in Oslo.



Figure 19: Examples of different media and forms of visitor participation in the exhibition 'Typisk dem' at IKM. Copyright: Hanna Z. Gogstad / Oslo Museum (2017), printed with permission.

IKM is part of Oslo Municipal Museums⁴³ and is located in the city centre off the main pedestrian area in a borough called Grønland, which is one of the most culturally diverse areas of Oslo. The exhibition space is hosted in an old prison and comprises an art gallery and temporary exhibition space where *Typical Them* opened in June 2017. The SIB team that visited the IKM included six people from the Grorud group along with the three newly recruited co-designers that I mentioned above and the museum team. The recently launched *Typical Them* exhibition was thematically similar to the *FOLK* exhibition in its discussion of racism, biases and xenophobia in our everyday life. The exhibition area consisted of some open spaces and associated small rooms that used to function as prison cells. In the first open space there were various interactive installations, as shown in figure 19. Visitors were invited to react to news releases related to the exhibition themes by writing and share thoughts in an audio recorded answering machine. Further, in the art installation ‘The Anatomy of Prejudice’, visitors were invited to share their prejudices, be it about vegans, old people or toddlers. The physical space supported both digital and analogue interaction (Vaagan and Bothner, 2020), as seen in figure 22. We could see that the exhibition provided opportunities to focus and concentrate, but also identified constraints in the lack of privacy and space for social encounters. Our co-design team engaged with the exhibition in a variety of ways, from passive observation to active interaction and group discussion.

⁴³ Oslo Municipal museums have three locations: <https://www.oslomuseum.no/oslo-museum/english/> date accessed 26. October 2021



Figure 20: Visitor participation through texts and photocopies of pictures in the installation 'The Anatomy of Prejudice' by Thierry Geoffroy/Colonel at IKM. The installation asks visitors to share traces of prejudice from their lives. Copyright Tobias Messenbrink (2017), printed with permission.

The critique phase of our workshop unfolded in this setting and each of us, with a notebook in hand, set off to examine the themes, space and stories told in the exhibition. As we were all guests at this exhibition, we hoped that would contribute to levelling the field of relationships between the museum team and our co-designers. Another function of the visit was to encourage a common vocabulary to support a dialogue of what a museum display should or should not be.



Figure 21: The author and a participant at IKM, exploring an installation that asks visitors to categorise themselves with stereotypical attributes. Copyright: Tobias Messenbrink (2017), printed with permission.

Sitting together around the lunchroom of IKM we were a mixture of former and new partners, and we figured the best way was for everyone to read something aloud from each notebook. We discussed what we liked about the exhibition as the following quote illustrates:

... I felt that I didn't have to read, I could observe and anyway get a lot of knowledge, and one could read more in detail, if one wanted to.

Followed by:

I liked that there was much to do and that there was much to experience on your own and at the same time together with others. I liked the quotes on the floor, that there was more than one headphone so you could listen together with others.

Conversely, we expressed what we disliked or were stunned by, such as places with too much text and some installations that were difficult to understand.

We had initially asked questions such as what we liked or not, why and how in order to support the reflection individually, in and with the notebooks.

The way the exhibition is interactive makes it more interesting, and the fact that one can contribute to expand it, is nice and makes one feel included.

As this quote from a notebook illustrates, interactives that required contribution and sharing of thoughts made a positive impression on us. This point was elaborated on by others: those activities that enabled us to generate content in the exhibition gave us a feeling of connection to the previous visitors. But what these notes also show, is a developing understanding among our co-designers of what interactive activities can bring into the exhibition space: signs, in other words, of increased understanding and articulation of a museum experience.

A short month later, we were back at the NTM's Maker Space area, for the **sixth workshop** and FT's Fantasy phase, on the 10th of October 2017. We aimed at creating scenarios of a possible future sound experience connected to the *FOLK* exhibition. A little anxious that there would be too few participants, I had also asked a young student who had her internship placement at the museum that day to participate. This meant that in this workshop there were four new and only three participants from the first series of workshops. Four of the young co-designers who had attended the critique phase workshop at IKM chose not to come to this workshop for reasons they did not disclose. Hence, I have to keep in mind that this flipped the balance, somehow it disturbed the young people's long-term part taking in the SIB. On the other hand, new conversations across other demarcations occurred, and in many ways responded to our mission of finalizing a digital installation in time for the exhibition opening. However, the conversations with Shukran and Stephen are my primary focal point for analyzing, as they followed the SIB the whole way.

To form groups, the three participants from the Grorud Youth Council were placed in three different groups. For balance, one researcher and one of the explainers and students joined each group. Dagny led this workshop. She asked us to think along the lines of viewing a visit to a museum as a part of a journey that starts before and lasts until after the visit. To play out the future scenarios of a museum visit, we used Playmobil™ figurines on self-produced stage sets. One of the subjects we had discussed both when choosing sound as media and during the process of co-design was privacy and the restrictions connected to the publishing of recognisable pictures, according to GDPR guidelines. Therefore, the groups were asked to develop activities that did not require sharing of photos.

Drawing on elements from drama techniques such as tell, make and enact (Brandt et al., 2012) we used the Playmobil™ figurines, Lego™ and straws to enact situations. As we

experienced with the *Friendship* project, one aspect with the plastic figures is that they are familiar from child's play, also recognisable as implements that facilitate pretend play by youths and adults. They therefore hold the possibility to bridge leisure activities with museum co-design processes (Dindler, 2010), as we also will see in the workshop later with children.



Figure 22: Design of a visitor journey, uploading sounds before to be interacted with and shared at the museum, Copyright: Tobias Messenbrink (2017), printed with permission

The scenario produced by the first small group, of which Stephen and I were part, involved visitors in uploading sounds to the museum before their visit. We played a family of three that decide to visit the NTM on a rainy Sunday and begin their journey by visiting the museum web page and looking up the *FOLK* exhibition. There we were asked to meet a challenge of recording 15 seconds of our favourite sounds, which subsequently was to be sent to a special phone number. Arriving at the museum they were given an iPads. They found their sound on the iPad and could mix it together with other sounds uploaded by other visitors. Together they could mix sounds into a story as well as illustrate it by using pictures from the exhibition. The finished sound narrative could be published on an Instagram account connected to the *FOLK* exhibition. Visitors were invited to share pictures from the exhibition, to be displayed in the *FOLK* as well as on Instagram after the visit.

The second scenario included a futuristic dome installation. As the small group who produced it were unable initially to decide who their target visitor group should be, they were instructed to consider a group of sound enthusiasts who are planning to visit the electronic music exhibition. Instead, they stumbled upon the *FOLK* exhibition and a strange kind of futuristic dome installation, as seen in figure 23 below. In the dome, sounds from all over the world obtained from national and religious holidays enhancing culture and identity are played. Standing in the outskirts of the installation the sounds are recognisable and separate, the closer one moves towards the centre the more mixed they become. The experience shows likeness between cultures, despite geographical distances. Another feature was the possibility to reach out to friends through social media in real time to ask them to contribute with sounds to the dome.

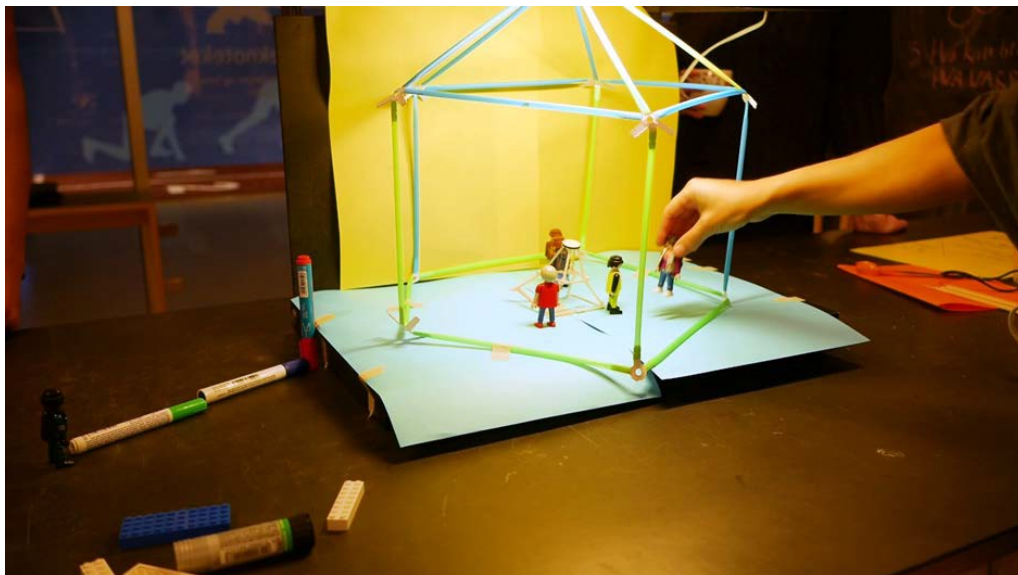


Figure 23: A futuristic sound dome, that delights sound enthusiasts to interact with. Copyright: Tobias Messenbrink (2017), printed with permission

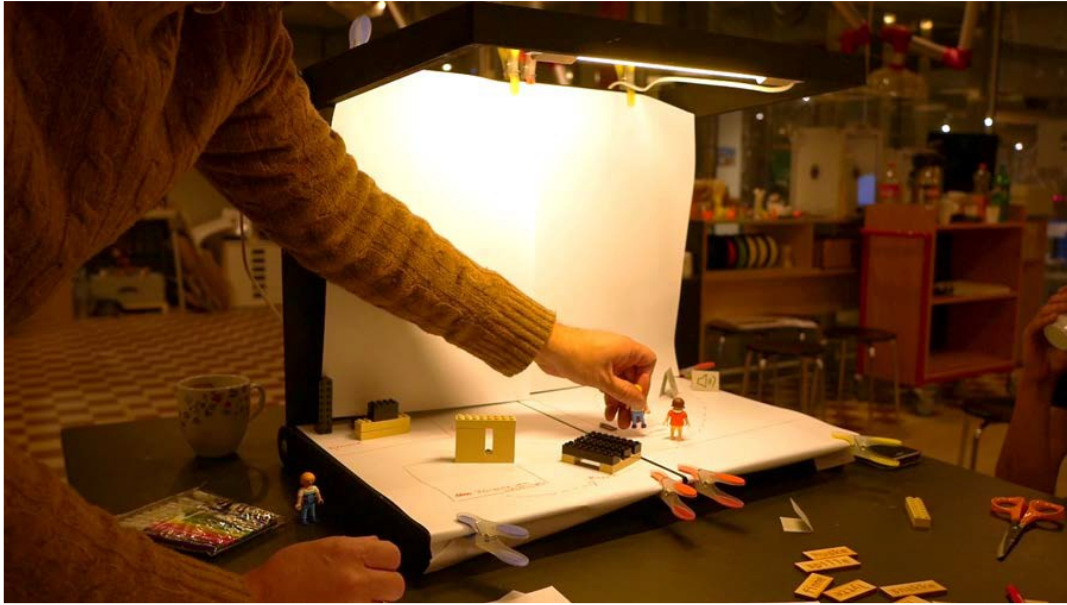


Figure 24: Uploading sounds from home and finding them in the exhibition. Copyright Tobias Messenbrink (2017), printed with permission.

The third scenario confronts the visitor with the question, “what is the sound of your identity?” This scenario starts at home, with the museum visitor sitting at home scrolling on Facebook and receiving a link to the *FOLK* exhibition that takes them to a mixture of sounds and voices from everyday life, and also the question ‘what is the sound of your identity?’ The visitor decides to go to the museum with a friend, when they enter the *FOLK* exhibition they are met by the same cacophony of sounds. They then understand that their own sound can be uploaded and be part of the sounds playing, or as the group also suggested, the sounds can be connected to different objects and when new visitors upload their sound and voices, the soundscapes changes. The same interactions with mixing sound and exhibition objects are possible to do remotely on the museum web site.

All three scenarios used social media as a way of facilitating participation and interaction. Furthermore, they were all about creating sound and sharing it in a sound library, rather than only listening to sound. Looking at our suggested visitor journeys and comparing them with what we saw and discussed in the critique phase, it becomes clear that our design provides a physical frame for engaging with sound and objects. All the scenarios scaffold interactions by offering practical tasks, although only one scenario includes co-creating between visitors. We find descriptions in our scenarios of sound activity on several levels, either just observing or actively sharing and participating – similar to Nina Simon’s participation modes as creators, critics,

collectors, spectators, and active users (2010).

Our scenarios featured sounds from everyday life, similar to the kinds of sounds we had explored in the very first workshops where we experimented with recording mundane sounds and using them to tell stories about everyday life. Thinking through these sounds, their stories, and how they can shape a museum visit scenario contributed to bridge experiences from everyday life among the co-design team, as well as to connect life outside the museum to the space of the museum (Dindler and Iversen, 2014). Sound as fluid and ephemeral holds potential to connect to the affective and thereby can create more affective experiences (Tajadura-Jiménez and Västfjäll, 2008; Witcomb, 2013). Co-creating sound stories and scenarios around sound-based storytelling facilitated the emergence of shared understanding among the team. Connections to the themes of culture and identity can be found in all three scenarios, either implicit (scenarios 1 and 3) or explicit (scenario 2).

With new members joining our co-design team, we struggled a little to get the conversation going in our small groups, and I found it difficult not to take the lead in setting up my group's scenario. When going through footage of the workshop later, I saw myself taking up much space, explaining and trying to involve everyone. One reason for my struggle was that we really did not know one another, which can be liberating as well as challenging, but in this case I found it to restrain communication (Akama and Light, 2020; Katrikh, 2018). Nevertheless, each of the groups managed to create one scenario. We presented and filmed our scenarios in front of the other groups, and the films were subsequently published in our closed Facebook group for all to see and to vote on the scenario they wanted to take forward.

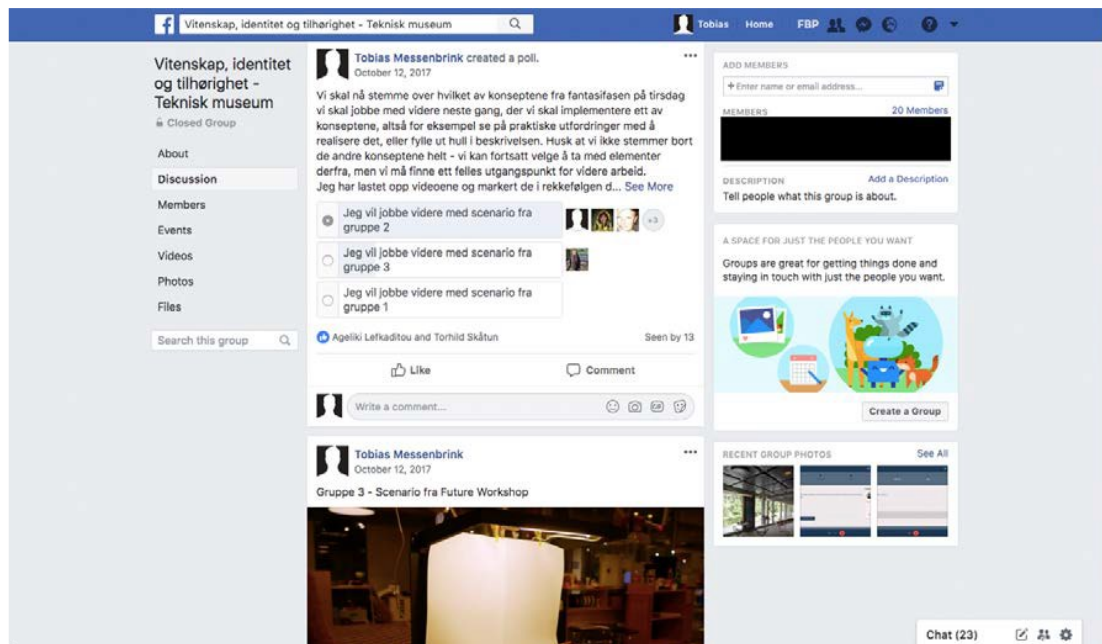


Figure 25: We asked all members of the closed Facebook SIB group to vote in a poll about their preferred scenario, screen shot of the Facebook page, date 07.02.2022

The scenario with the most votes was the futuristic sound dome. Our intention was to use the winning concept as a starting point and include elements from the other two scenarios as appropriate for our final design. Despite sending reminders by text message, we did not manage to engage more than one of the co-designers from the Grorud Youth Council to vote. This may have been due to the length of the films, which lasted from seven to almost nine minutes, or because several members had left the SIB project having ended their assignment with Grorud Youth Council.

A week later, on the 19th of October 2017, we met again for the **seventh workshop** for the implementation and realisation of the sound dome scenario. As in the previous workshop, we used the Maker space where stage sets, and plastic figures were stored. Apart from our new participants, Shukran and Stephen were the only ones from the Grorud Youth Council who attended this workshop. With the museum team, there were nine individuals present. All three scenarios from the Fantasy phase were displayed exactly as we had created them a week earlier. We placed ourselves in a big circle and discussed the concepts, the exhibition and the placing of the installation.

To ground the discussion within a realistic frame of opportunities and possibilities for our sound activity to be integrated within the *FOLK* exhibition, we chose to start with a presentation of the floor plan of the *FOLK* exhibition by the curator. Ageliki used the floor plan to explain how the exhibition was planned, pointing to places where sound from other sources could interfere, as shown in yellow marks in figure 26. It was also at this point in time that the design of the *FOLK* exhibition area was finalised and decisions about objects, pictures, texts, and films to be included were also finalised. Scrutinising the exhibition plans showed us that there would be no ideal space for the sound installation inside the exhibition area, leading us to decide to place our exhibit outside the exhibition in the foyer which is approximately 60 meters away from the entrance of *FOLK* (a few months after the exhibition opening, however, our exhibit was moved to right outside the exhibition entrance) (see figure 5).

Once we had identified the location, we continued discussing challenges and opportunities related to the chosen scenario, adding new ideas and making adjustments, and after a long discussion a rough concept was agreed upon. The concept had features that are prevalent in participatory exhibits, such as the ability to generate content (sound) and to combine content (assemble sounds into a larger piece), or to use social media to reach out in different ways, with the museum reaching out to visitors and the visitors reaching out to their friends and others.

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interesting tool. Several co-designers had noted in the Critique workshop (fifth workshop) that they had seen on social media some of the film-clips featured in IKM's *Typical!*, e.g.:

“Utopia”, that one I have seen several times.... when it became part of the context of the exhibition it became very pertinent, and unpleasant as it is a children's movie. (Catharina 18 years)

This underscores that an experience within the space of a museum holds potential to be perceived as more serious, or as expressed here as unpleasant (Macdonald, 2007b). To place the film in the context of the *Typical* strengthen new connections and thoughts (Dindler and Iversen, 2014b). The discussion of how to create a sound activity that would spark engagement on issues of identity, belonging and ethnicity among the museum visitors continued. We touched upon uploading sound before visiting the museum but concluded that it may limit the interactions with the installation instead of opening it up.

To use social media for sharing sounds outside the museum space was another idea which was rejected. The young people expressed that it could be quite embarrassing to show that you were in a museum and, as one participant commented, young people probably share much less on mainstream social media like Facebook now compared to a few years ago. Even so, our target audience for the digital activity was not exclusively young people, and at this point the discussions about how a museum experience could be connected to everyday life was in itself interesting for the museum team.

Subsequently one participant proposed that a task for users could be to answer questions such as ‘which sounds make you happy?’ and ‘which sounds make you sad?’

Elin: They can ask which sound make you happy, and you can choose between four or five

Shukran: Yes.

Dagny: Hm.

Torhild: Which sound does make you uneasy...?

Shukran: ...of these. Because then one doesn't need to do anything, then it at given points.

Ageliki: But if I understood correctly, this reminds me of Typisk dem, there you could choose which labels represent you and you could say like, Norwegian, woman, you had some categories and then you described yourself.

Shukran: It is alike, but here you must choose, not like a free search: If one has to think by oneself, one use much more time. It goes much faster if one has to choose one of these rather than if you have a task to write something for oneself.

As can be seen above in the extract of the transcript from workshop 8. This resonated well with the rest of the group and was in many ways representative for how the design of the digital sound installation proceeded. These concrete and direct questions can be traced back to our very first piece of co-design work, when we brainstormed around the terms ‘identity’, ‘belonging’ and ‘ethnicity’, or as written on the brown paper roll by one participant: ‘How one as a person feels’. Somehow, our new partners had internalized the process and the groups train of thoughts, as it was only two young men who had been part of the whole process and could point back to the very first co-creating activities and the initial conversations.

The implementation phase continued with more discussion and the original ‘winning’ concept was pushed and altered until it was not entirely recognisable as the concept from the fantasy phase. These discussions and negotiations during the seventh workshop led to our final concept: a digital installation called the ‘Sound of *FOLK*’ that we placed in the museum foyer in time for the opening (figure 13). We created a dome structured in a shielded area that would facilitate interaction with sound in an activity that lasted around five to ten minutes.



Figure 27: Left: Sound of FOLK exhibit installed in the museum foyer just before the exhibition opening in March 2018. Copyright Tobias Messenbrink (2018), Right: Sound of FOLK exhibit moved to the entrance of the FOLK exhibition in June 2018. Copyright Håkon Bergseth (2018). Both printed with permission.

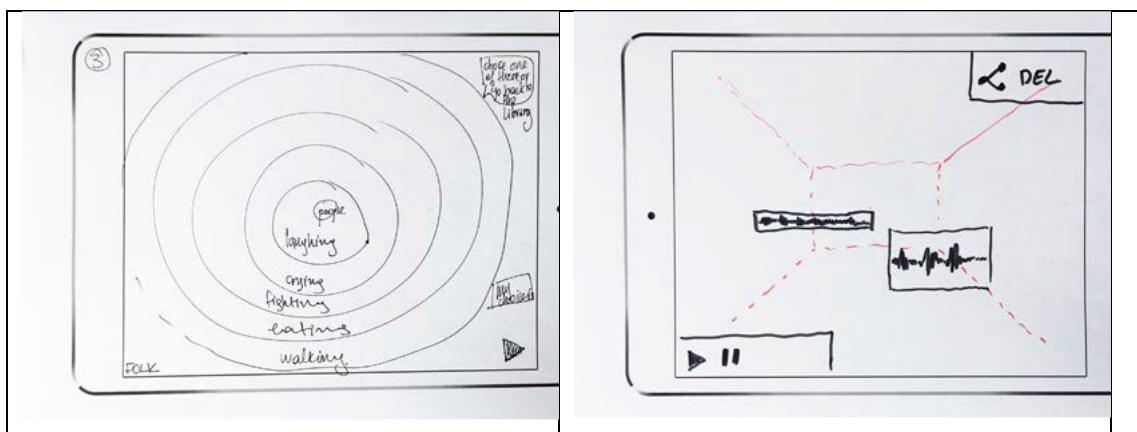
Although we had originally intended to make the activity online, instead we opted for more of an onsite experience largely due to technological feasibility and the time restraints that Tobias and I would have to manage, respectively programming and installation, before the exhibition opening date. Besides these constraints though we also took into account our young co-designers' lukewarm attitude towards sharing on social media, evidenced both by us having to supplement group communication on Facebook with text messages, as well as their explicit statements about not wishing to share museum experiences on social media. Had this been a museum designed rather

than a co-designed product, posting on social media may well have featured in the visitor experience, ending up with a platform that no one in our co-designers' age group would use. Our product clearly depended on who was involved in its design and made decisions about it (Bratteteig and Wagner, 2016; Smith and Iversen, 2014).

The next step was for Tobias to build a prototype, and our co-designers to evaluate it in a final workshop. We were now four months before the *FOLK* exhibition was due to open, and the museum team felt the pressure to have the Sound of *FOLK* exhibit ready on time, resulting in shutting all of our young co-designers out of the build. This underlines the tension between pluralizing and stabilizing, on the road to a finished product. Nevertheless, Tobias and I continued to collaborate on building the prototype in close communication with the *FOLK* exhibition design team and curator Ageliki.

The decision to make the Sound of *FOLK* an on-site only experience meant that we could not count on visitors uploading and sharing their own sounds, therefore the exhibit used a pre-populated sound library. This was not unlike our experience in one of the earlier workshops, where instead of bringing their own everyday sound recordings our young co-designers had to rely on sounds provided by Tobias to build their sound stories. In a similar way, the Sound of *FOLK* user would have to choose which feeling to describe with sound, the options were happy, sad, surprised or frightened, then choose sounds from a selection to associate with it. figure 28 below illustrates how we the Sound of *FOLK* implementation started with drawings and progressed to high-fidelity interface designs.

Figure 28 below illustrates how we the Sound of *FOLK* implementation started with drawings and progressed to high-fidelity interface designs.



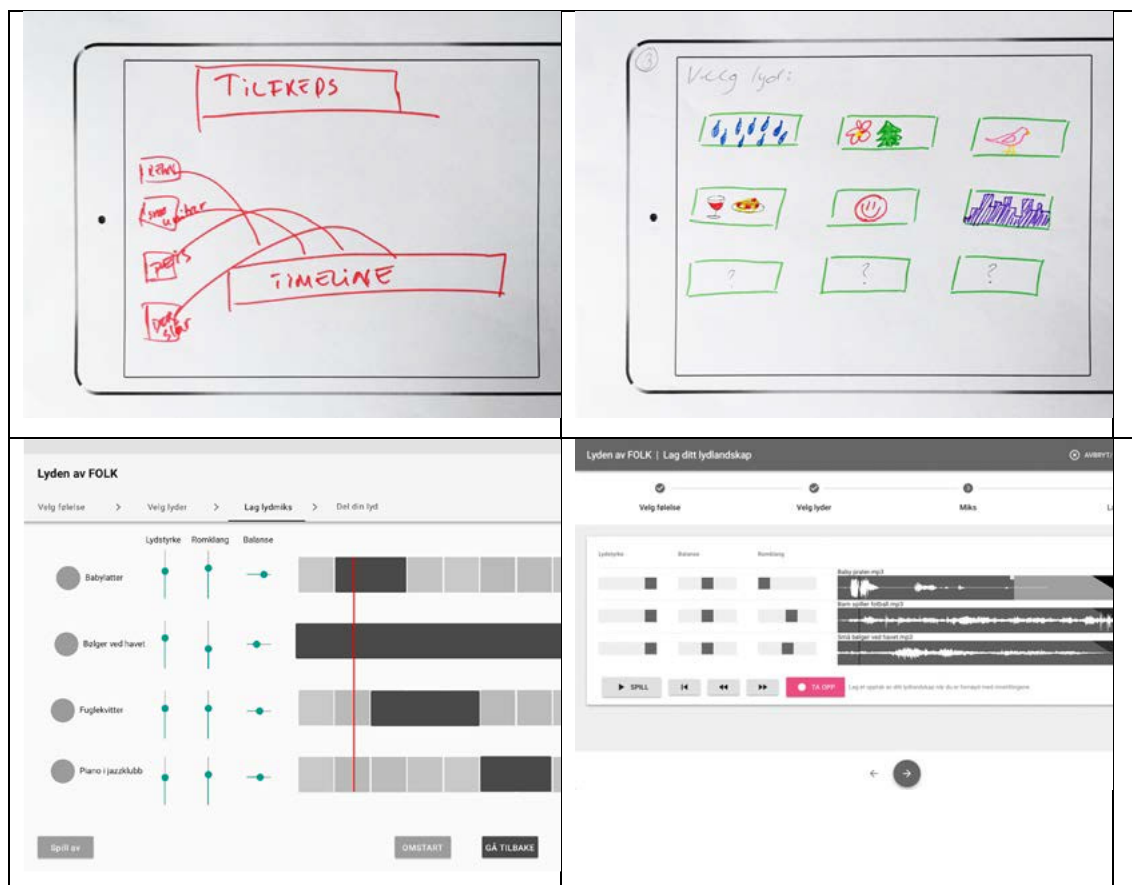


Figure 28: From the drawing board to editing of sound interface designs. Reproduced with permission from Tobias Messenbrink (2018).

The final **eighth workshop** then took place on the 22nd of January 2018, to test and evaluate the Sound of *FOLK* exhibit prototype that Tobias built on a tablet, with a limited number of available sounds and a black and white interface (as per figure 28). Four participants from the Grorud Youth Council attended, two of whom had not attended the previous Future Workshops (workshops five to seven). Besides a post on Facebook, I had also reminded our young partners from Grorud via SMS, but did not really know who would turn up, since no one had confirmed. The group had been exposed to other forms of prototyping in previous workshops; we had, for example, sensitised them to sound during the initial explorative workshops and guided them to make scenarios of use (Carroll and Rosson, 1990) during the fantasy workshop. This time we used the prototype to explore how the sound application might be used, what questions might emerge about the use of the exhibit, and to individually evaluate the whole process by answering some questions in writing.

We wondered if our co-designers recognised the sound installation and asked whether the outcome, the Sound of *FOLK*, was representative of the co-design process (see:

Dindler and Iversen, 2014; Smith and Iversen, 2014; Taxén, 2004; Tzibazi, 2013). The following two responses capture the reactions about emotions and sound, and point to how our design partners experienced their influence on the design outcome:

- “There was much about feelings [which had been] repeatedly discussed throughout the workshops, among other things sound”.
- “I found elements from when we talked about a programme that could collect sounds. I also found sounds of feelings”.

This happened despite two participants not having participated in the Future Workshop sessions, suggesting that in our addition to the requirement to use sound imposed initially by the museum team, our design was also bound by design ideas that emerged during the early co-design workshops. However, several participants felt that they had more influence on the design outcome during the Future Workshop sessions than the first four workshops:

“I think that the last workshops had more influence than the first [few workshops]”.

The first four workshops were exploratory and experimental, allowing us both to develop a shared understanding about the theme of the exhibit and its relation to the *FOLK* exhibition as well as to search for a way to facilitate and structure our dialogues and actions. The openness of these initial workshops and the lack of a pre-defined form for the design outcome gave us more design freedom.

Two of our young co-designers, Stephen and Shukran (who as we will see shortly, continued with the second phase of SIB), also offered their reflections on the first phase of SIB. First, the fact that the time periods between workshops (typically one month) were too long, time during which our young co-designers felt like they were drifting away from the project, details of the previous workshop fading in their memories: ‘a lot happens in a young person’s life during a month’. Second, the young co-designers raised the issue of sitting around the round table which they found somewhat tiring at times, as they felt that they were expected to give ‘smart’ answers and found it easier at times to stay silent. Furthermore, they did not find it easy to always follow the conversation, as the workshops occurred late in the afternoon after long school hours. It is possible however that, in addition to these reasons, the museum team were leading the conversation at a level that the young co-designers found hard to follow and engage

with.

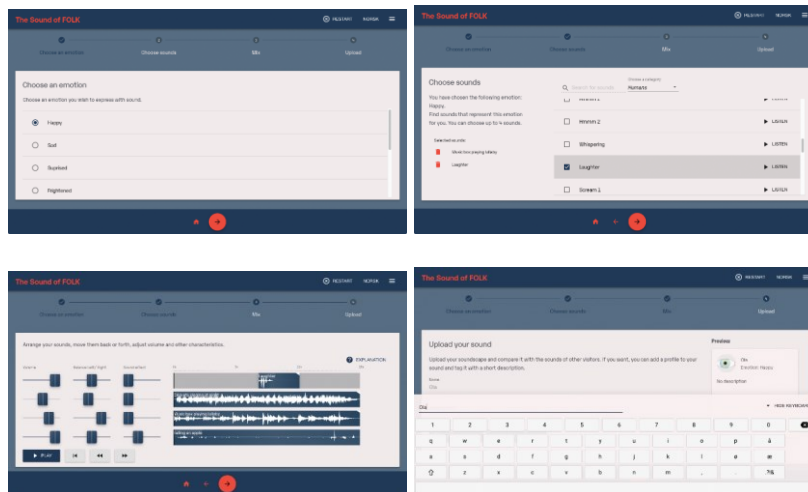


Figure 29: The sound of FOLK tablet interface. Choosing a feeling, then a category like home or nature, then four sounds that are uploaded to be edited and shared. Copyright Tobias Messenbrink.

Following this final evaluation workshop, the Sound of *FOLK* interface was implemented as shown in figure 29. In the centre of the exhibit, we had a sound directional ‘shower’ around four tables, which were of different heights to accommodate visitors with different needs and had two pairs of headphones on them each (see figure 27 on page 139). Inspired by Nina Simon’s (2010) ladder of participation, we set up the activity so that visitors could interact with the Sound of *FOLK* by just listening and observing and/or by creating and sharing. Furthermore, we aimed at making a light entrance to a difficult topic, as Stephen, one of our co-designers, expressed later on, pointing out that the *FOLK* exhibition space was dark and its topic ‘heavy’.

3.5 In-between SIB phases: *FOLK*, from racial types to DNA sequencing

After the *FOLK* exhibition launch with the Sound of *FOLK* installed just outside the main exhibition area, I developed a learning programme for the exhibition in which I used sound as a tool of reflection and expression. I invited participants to the programme with the following:

Research helps us to find knowledge about the world so that we can understand it better. The exhibition *FOLK* will tell us that research is characterized by ideas, experiences and thoughts from both the past and the present. In other words, knowledge is not fixed, but something that is constantly changing, in step with time and society's norms.

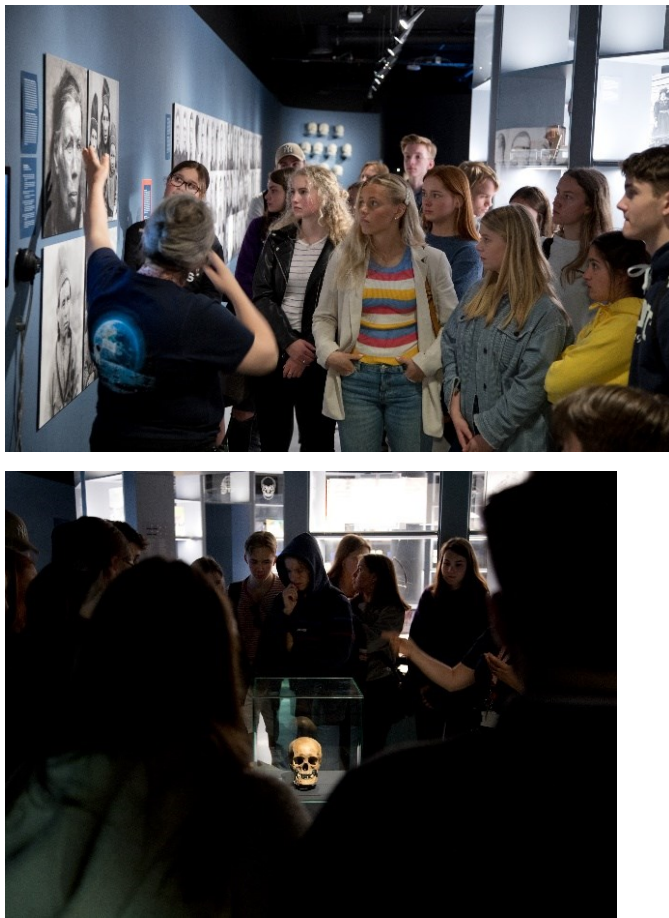


Figure 30: Students taking part in the learning program of the FOLK exhibition. Copyright Håkon Bergseth (2019) printed with permission.

During the lifetime of the exhibition, the learning programme was offered to students in high school between the age of 16 and 19. Inspired by the Sound of *FOLK*, the students were taken on a tour of the exhibition followed by a sound-based activity where they were asked to take one of the objects, photographs, or films as a starting point to compose a sound story on an iPad. The same sound library that was used in the Sound of *FOLK* was also installed on the iPad. PhD researcher Kaja Sontum who followed me on several sessions of the learning programme wrote in her paper that “this programme suggests that museums can be spaces for in-depth discussion, both within the group and with the museum (here represented by the museum pedagogue) on these topics” (Sontum 2018). This same programme I later took on to redesign for younger children in the second phase of SIB.

As well as the learning programme, I also created summer jobs at the museum as assistant explainers and offered these to our phase one young co-designers, seven of whom took the offer. During the eight weeks of the museum’s summer opening hours

(from 11.00am to 6.00pm), young adult explainers who are enrolled in higher education programmes are mainly responsible for operating the galleries and running activity programs. Two of these young adult explainers had been recruited to join our co-design team the previous autumn. In addition to doing regular rounds in the exhibitions to meet visitors, the explainers are responsible for arranging activities like the Science Show, the maker workshops (to make rockets or buttons), and the museum tours. The explainers programme enables to diversify the museum staff and to work alongside young people, thus increasing the museum's knowledge about how young people experience the museum and vice versa. Opening the museum as a possible future career option for young people with cross-cultural backgrounds, will hopefully contribute in the longer term to diversifying not only the front of house staff, but also the curators, conservators and educators. I opened this programme up to our young co-designers and divided the available days between the seven young people who were interested, ending up with three to four days' work for each of them during the summer of 2018. This co-presence and collaboration outside SIB gave us more opportunities to build on our co-design relationships.

3.6 SIB Phase 2: Co-facilitating the design of a museum learning programme (Dec 2018–Mar 2019)

A year after the *FOLK* exhibition launch, I embarked on a new co-design adventure related to the exhibition. I asked Shukran and Stephen from phase 1 to also participate in the second phase. They had both taken part in nearly all of the workshops and had also accepted the offer to work as assistant explainers at the museum during the summer of 2018. In addition, they were friends and they had both expressed that they liked the project of co-designing the Sound of *FOLK*. In cooperation, we planned to develop a learning programme aimed at children between 11 and 13, using sound as a way of exploring and making stories connected to the objects and photographs from the museum collection. Shukran and Stephen were to be engaged as the lead facilitators of the learning programme co-design. My original intention was to take the existing *FOLK* learning programme and re-design it to be relevant for younger children as our target audience and with our young co-designers in the driver's seat. As I will explain later, not all of these intentions materialised.

I also contacted Dagny and asked her to be part of the project. Tobias had at this point

finished his Masters and sought new challenges outside the museum, and Ageliki was engaging in new projects; I needed someone to work closely with in both planning and organising as well as facilitating the next round of co-design. In my view, it is very difficult to embark on co-design on your own, considering that the process involves complex human interactions and logistics. To capture what is happening is a demanding exercise, and in any case collaboration strengthens dialogue and understanding. In this case, my task was bigger, as I also had to ensure that the workshop facilitators were well supported. Furthermore, Dagny was known to our co-designers, and I felt safe working alongside her.

Thus, the museum team from SIB's phase 1 was the starting point of our group of four – myself, Dagny, Stephen and Shukran – continue to collaborate in phase 2. Together we planned and implemented one co-design workshop with younger children. Two meetings took place among us four to prepare for the workshop, then the workshop took place, and the four of us met once more after to discuss what happened.

Our **first planning meeting** took place in the museum café on the afternoon of the 18th December, 2018. The main decision made in this meeting was to organise the co-design workshop with children from the Gorud district during the winter holiday in February the following year, 2019. As this was a school holiday for everyone in primary and secondary school, we would have time to meet during the daytime for workshop preparations and for running the workshop.

Following the meeting, our efforts to recruit young children from the Gorud district failed. Our co-design workshop was competing with other holiday activities such as a trip to a water park or a ski trip in the mountains. Perhaps our co-design activities seemed a little more school-like even though they took place outside school. Given the time limits, I invited colleagues with children in the target age group (11-13), as did Dagny at her workplace. We managed to recruit four participants.

Shukran and Stephen had meanwhile been hired as assistants by the NTM to help out with the Science Centre's activities in local libraries in the Gorud district. Hence, they had a reason to be at the museum on Saturdays, and we made an appointment to meet again in the LAB area when they were finished with their museum work.

This **second planning meeting** took place on the 21st of February, 2019. We talked for approximately an hour, mainly about how to organise the workshop, which activities to

facilitate and how, what we could expect, which spaces should be used, arrangements for lunch and refreshments, and so forth. Looking into my notes from this meeting, I can see that I am asking many questions about how they had experienced and how they remembered the first series of Future Workshops, though the focus remained on the forthcoming Future Workshop and the planning of activities for its different phases.

One of the things we discussed in this second meeting were the SIB themes of ‘identity, science, belonging and ethnicity’, to which we decided to add the theme ‘sorting’. Out of the transcripts from the meeting, I see that we discussed this back and forth, whether and how the children would understand the meaning of these terms. Both Shukran and Stephen were unconvinced that younger children would grasp the meaning of the terms, drawing on experiences with their younger siblings and questioning whether the terms would be comprehensible for this age group. Their intervention on this issue clearly shows how the scaffolding of cooperative interactions between co-designers who are closer in age may bring forward a closer understanding and empathy of the target audience (Fails et al., 2013; Guha et al., 2005). Nevertheless, we concluded that to use terminology consistently across all of the SIB projects would help to connect the two phases, but we should be prepared to also use other terms that convey the same meaning and with which the younger co-designers may be more familiar.

Shukran proposed a warm-up activity that he had himself experienced at the Nobel Peace Centre when he visited with his school. This consisted of putting a coloured dot on the forehead of each participant, then ask them to find other people with the same colour dot and form a group, but one participant is left alone as no-one else has that colour dot. The activity facilitates a dialogue about the fact that we all need to belong to a group even as we are different. We decided to go forward with this idea.

Throughout this planning meeting, Dagny and I talked the most, even though there were several pauses where we tried to let our co-designers contribute to the conversation. We moved between the concrete, such as how long time to spend on each activity, to the more abstract issue of how to use the Future Workshop approach. Sometimes I explained and Dagny tried to clarify, but reading through the transcript afterwards, it appears that not always succeeding in the attempt to give space for our co-facilitators to fill. I can also read that we tried to activate the different FW phases by naming them, such as pointing to practicability of how to organise the fantasy phase and how we could arrange the implementation phase. Further, we discussed group dynamics with

Shukran making a point that not everyone is comfortable speaking in an unknown group.

We set up a plan for the workshop and focused on the roles of the team, contrary to my suggestion that I should welcome the young children on behalf of the museum, we decided that Shukran and Stephen would be the ‘welcoming committee’, and that they would then give the word to Dagny or me to explain why we were gathered and describe the research project.

The **second phase co-design workshop** was held on Saturday a week later, on the 16th of March, 2019, from 1pm to 5pm. Four younger co-designers attended: one thirteen-year-old boy, two ten-year-old girls and one twelve-year-old girl. The two girls were accompanied by the mother of one of them, the other two children were each accompanied by both of their parents. While the children took part in the workshop, the parents stayed close to the museum. Some of them went to run errands nearby, while two were provided with an office to work in. This gave us the opportunity to invite them in later to see some of the work the children did.

We gave notebooks and pens to the four children and asked them to write notes in the form of microblogs, meaning short sentences and keywords, in the breaks between the workshop activities.



Figure 31: Discussing and writing words associated with identity, ethnicity, belonging and sorting on post-it notes in two groups. Copyright Hermann Ruud (2019). Printed with permission.

The workshop started in the *FOLK* exhibition. In contrast to the workshop leading up to

the Sound of *FOLK*, there was now an exhibition, filled with content that included text panels, objects, films, posters and photographs. The workshop took place during the opening hours of the museum, and we sealed off the exhibition space to ensure the children were both safe and had ample space and no distractions during their exploration of the exhibition. The exhibition viewing started with Shukran and Stephen, as lead facilitators, introducing the workshop, explaining why we were gathered, and how long it would last. They had obviously discussed among themselves how to start the workshop, and provided an exercise we had not discussed, where in addition to saying their name, the participants were also asked to reveal the colour of their toothbrush. Subsequently, they signalled to Dagny and me to explain why we were gathered. I explained it as follows:

We are here today because we are very engaged at the Technical museum (NTM), to develop learning programmes and activities, and we like that those in the target group are involved in developing... Today, we are to develop an idea or concept, an idea or draft of a learning programme at a museum that lasts 45 minutes and is about this exhibition we are sitting in now. It is called *FOLK* from racial types to DNA sequences In addition to designing this learning programme, we are examining what we call participation and children and young people's right to participate.

Then Shukran explained how to play the colour-dot game, and soon the eldest of the children found which group everyone belonged to, by pointing to equivalent colours in the exhibition, and then on the colour-dot glued to the forehead. Stephen and Shukran explained afterwards that the exercise was to illustrate that if one is different from others then one can end up without belonging to any group of peers:

Stephen: "So what do you think, do you want to talk a little about what it was like to be in groups? Can it be associated with your everyday life? That one is in different groups? You all go to schools, don't you?"

Child 1: "Yes, those who are similar then pull together. It's natural whether you think about it or not, my friends have the same interests, [play] the same sports and things like that."

Shukran: "Yes! Have you experienced something like that in everyday life?"

Child 1: "How then?"

Shukran: “An example?”

Child 1: “No, not really. Most of my friends play instruments and climb, just like me.”

Stephen: “Yes, then you are a group.”

I had written Identity, Belonging, Ethnicity and Sorting on a brown paper roll, as we did in the phase 1 workshops. We started to explore these terms by trying to understand what they meant. Stephen and Shukran elaborated and explained the terms beginning with identity and pointing to likenesses between them, such as being boys and going to the same school. Then they described ethnicity as where someone originally comes from. Furthermore, the participants were encouraged to use the workshop experience as inspiration, as well as the objects and historical photos. Next, the plan was for each participant to write down words associated with these themes, which turned out to be challenging. The conversation went very slowly, and it was the facilitators and the older boy who wrote words on post it notes. It turned out, Stephen and Shukran were right that our terminology might be obscure for our younger co-designers.

The table in the centre of *FOLK* where we worked was round and quite large, but it still did not work well with a long paper roll in the middle. I cut and split the paper roll in two parts. On impulse we formed two groups led by Shukran and Stephen, with one researcher and two children in each group. In one group the conversation flowed better, with the participants moving around the terms, grouping them, and analysing their meaning. The second group struggled to get the conversation going. The unevenness of the two groups’ performance may have been a result of the combination of small group sizes and lack of opportunity to get to know each other before the co-design commenced. Shukran commented on the first point in the podcast a year later:

I agree with Stephen that we prepared a lot, but I still think that something that was a little problematic with the workshop was that we had few children. To make the workshop more legit, we should have had at least 10 kids (Shukran, 20 years)

Furthermore, unfamiliarity with each other made it difficult for those in the second group to position themselves in relation to others across age groups and personal interests. Our young co-designers lacked the common interests that our co-designers in phase 1 had (remember they were all members of the youth council), and so

communication was between them was not as natural. Design processes that involve children demand time to get to know another. As Guha et al. (2005) explain, if children feel discomfort, they do not take an active part and it is often visible if they do not like the activities.

Following the brainstorming activity, we gave the young children time to explore the exhibition on their own, supported by Stephen and Shukran while I run to the café to get food and drinks for all of us. As *FOLK* was now opened to visitors and a scheduled public tour of the exhibition was due at one o'clock, our co-design team moved the museum LAB for the next stage of the workshop, to create a scenario of a possible learning activity.

In the LAB, we had arranged the same small stage sets and plastic figurines as we had used during the phase 1 FW to enact a workable scenario. The two youngest formed one group; the twelve and thirteen year old formed a second group. Shukran and Steven asked Dagny and me to form a third group to create a scenario. I was tasked to explain the scenario building to the young children:

...We talked a little bit about those concepts... So, what we are going to do now is simply make a sketch, but not with writing or language or anything like that, but with using these figurines.

Stephen and Shukran emphasised that everything was allowed in our scenarios, and that one could for example expect to pick up an iPad when entering the exhibition. The two youngest, who knew each other before the workshop, started very quickly to work on an outline, as if they were continuing a game. They designed an activity that was about collecting objects in a basket, resulting in a film being shown on a screen for every object collected. The group with the twelve- and thirteen-year-old took longer to get started. They had somehow listened more closely to the task instructions, and their ideas were very much connected to their experiences as pupils and more appropriate for a learning programme, for example proposing activities such a quiz that tests knowledge. Now this was not what we intended to create, but our explanation that the group's scenario should connect closely to learning perhaps not unexpectedly made the activity resemble a school lesson. Dagny's and my suggestion was to create an experience of having been singled out in a crowd, and that pictures should be taken of the whole class and some randomly selected was hung up beside the photographs in the exhibition.

We ended the co-design workshop by choosing one concept. As Shukran noted, it was Dagny and I who had to make the choice as the children voted for their own scenario of a future museum learning journey. Assuming it was more playful, we chose the one that gathered objects in a basket and when an object falls into the basket, a historical film is played. However, to recognise all contributions and avoid disappointment, we discussed the other scenarios too and integrated some of their elements into the winning scenario.

When the parents came to collect the children, we asked them to be the audience and the children to enact their scenarios for them. Before the enactments, Shukran and Stephen summarised for the parents what we had done during the four hours we had spent together, starting with an introduction of the term's identity, ethnicity, belonging, sorting, and pointing out that, for some, the concepts were interrelated:

Identity and belonging have many similarities that can mean that, for example, the country you are from can play a role in who you are, but also who you feel you are.

This summing up and elaborating by Shukran and Stephen on the different concepts and exhibition themes, shows clearly the insights they gained through their co-design experiences into pedagogical tools and approaches. Furthermore, giving all four younger co-designers an opportunity to point out some elements that were their own contribution, demonstrates the sense of care for each and every young co-designer.

Saturday a week later, on the 23rd of March, 2018, we met again for our **final reflection meeting**. We met at the museum, after Shukran and Steven's explainer shifts. We now had a shared and fresh experience to talk about and the conversation flowed freely. I had made no concrete plan of how to go forward reflecting on the workshop, and when Stephen suggested that we follow the plan for the day and analyse what we did and what worked well or not, we agreed with his suggestion. In many ways, the conversation was about pedagogy and how to facilitate a process that is beneficial for all participants.

We started by discussing how the 'get to know each other' activity—the colour of the toothbrush— worked, and Dagny and I recognising it as a nice and safe activity that made the young children to speak out aloud. Then we continued to reflect on how the activity with the coloured dots on the forehead went. This did not work that well with

few participants who did not know one another, and the one who ended up standing alone with a different colour looked very lost.

We then discussed how the associative brainstorming activity around the key words could be modified. Stephen read from one of the children's microblogs that it was difficult to find words and suggested that providing a preprint of utterances and words for the children to sort into the different categories would make a simpler entrance. We concluded that this task turned out to be too difficult, and just as Shukran and Stephen had pointed out before the workshop, the children did not have the extent of conceptual apparatus that Dagny and I had assumed. Diversity was another theme that was difficult for the children to grasp and for facilitators to scaffold, as illustrated in this quote from Stephen in the podcast that was produced a year later:

“I think the struggle was when we were going in that theme, diversity, it was difficult for us to understand that and when we are to teach even younger children that's the struggle. So, I think that is the reason we used so much time to teach them, in a child-friendly way, to teach them what diversity is. Even though we have diversity everywhere, the children don't like understand that, so we had to show them like in their view what was diversity so that was the main problem.”

In the children's microblogs we also found some reflections on the necessity of discussing further where we come from. We agreed that if a new workshop was to be arranged, the task order and themes for dialogues would have to be organised and emphasised differently. Viewed from a museum pedagogue's everyday life, reflections like this will conceivably change the design of the next workshop (Ash, 2019; Schön D.A, 1984).

We also wondered whether it would have been better to split the two participants who were already friends (the two girls) into two different groups. However, recognising that one of them was shy and silent, meant that the effectiveness of asking her to work with someone she did not know was dubious. Shukran and Stephen experienced this in the first series of workshops, that creating scenarios with people you do not know can make you go quiet. At both occurrences, groups were put together across age groups when creating scenarios, something our facilitators did not find comfortable.

In the microblogs the children wrote that they were enthusiastic about the task of

creating museum experiences. This engagement tells us that the co-design experience has been positive, and one can trace an increase in understanding of what a museum experience is or can be. This perception that someone who participates in co-design processes is involved in creating an exhibition or an experience, I recognise from the first round when we made the ‘Sound of *FOLK*’. Clarifying expectations of what a programme can actually result in becomes important for reinforcing an awareness of purpose (Fossland, 2017; Kirby, 2004).

The papers I have written during the course of my PhD endeavour (2016-2022) have illuminated the SIB case from different angles and with different theoretical lenses. As this research rests in the tradition of PAR, there have been a constant movement between empirics and theory, dialogues and actions (Levin, 2017). Furthermore, some key terms have trickled throughout the whole thesis; museums, young people, digital, partnership, choice, control, dialogue, knowledge development, facilitation and co-facilitation. Beyond the descriptions of the case in this summary, I would like to point to my three academic papers, the professional paper as well as the conversation the podcast, and how they have impacted and driven my thoughts forward. In written orders first the paper on curatorial reflexivity takes departure from a curatorial perspective and analyzes the impact of partnering with young people during the development of the FOLK. In this co-written article (Stuedahl, Skatun, Lefkadiou, Messenbrink 2020) we were curious about how knowledge prosper in a close dialogue between museum professionals and young people and how these conversations impacted judgment and concern related to the curatorial choices. The second paper investigates how conversations between experts and non-experts can create spaces for engagement (Skåtun, forthcoming). These two papers are based on the first 8 workshops that led up to the sound installation and the exhibition opening in March of 2018. My professional paper comprises both phases and discuss the usage of FW as a structuring method for creative processes. The last paper explores role change as well as how knowledge and insight moves and is actualized in new contexts. Our issues that are up for discussion connects to the topic of FOLK, and how a science museum can support a dialogue on controversial issues (Skatun et. al forthcoming).

To end my case-description I would like to repeat the importance of creating safe spaces, where facilitators and organisers strive towards reciprocity with an emphasis on care for all participants (Morse, 2020; Stuedahl et al., 2021). Something that applies in

all meetings with visitors to the museum is that the atmosphere should be welcoming and all visitors should feel safe and taken care of, whether it is in terms of building science capital for individuals and groups or it is co-design processes (Archer et al., 2015; Dawson, 2018; DeWitt et al., 2019).

4. Participation and dialogue: Curatorial reflexivity in participatory processes

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4 Participation and dialogue

Curatorial reflexivity in participatory processes

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Introduction

Lately, several museum projects in the Nordic countries and around the world have explored the potential of extending museum participation into actively involving users in the process of museum exhibition design. This participatory museum paradigm shift (Holdgaard and Klastorp, 2014) defines visitors as collaborators, who bring into the museum design process diverse knowledge, expectations and experiences. The aims of this active visitor involvement are multiple and include the pragmatics of shaping relevant activities as a political endeavour of democratising cultural heritage institutions. This new situation raises key reflections for museums such as (a) how museum professionals co-produce knowledge in dialogue with museum users, (b) how museums may develop infrastructures that embrace participatory methods in ways that are meaningful to diverse visitor groups, and (c) how museums may fulfil the role of open cultural heritage institutions as places for social change, dialogue, democracy, human rights and activism (see e.g. Black, 2010; Marstine, 2011; Message, 2006; Sandell, 2016). This is a matter of how museums and museum professionals constitute their sites as organisations for public dialogue and participation, rather than as institutions that merely exhibit objects (Lynch, 2011; Parry, 2007; Phillips, 2003).

The participatory museum paradigm comes in parallel with the ‘turn to openness’ currently going on in cultural heritage institutions, which includes aspects of sociability and designability (Marttila and Botero, 2013). Openness requires dialogue and participation, and being attentive to what visitors know and how that knowledge may change the institution. Visitor involvement establishes connections with audience groups that go beyond the ‘boundary encounter’ practices (Meyer, 2010) employed when, for example, amateurs are mobilised in collecting cultural heritage objects (Star and Griesemer, 1989). Participatory processes create relations that help museum professionals to attune to their visitors’ interests. Rather than

being understood as activities related to content, visitor participation has been framed as a knowledge process that connects museum staff with societal issues, and as a method to open up museum exhibition design to views and preferences of the audience (Stuedahl and Smørdal, 2015).

The encounter with visitor groups or stakeholders as participants in a collaborative process requires dialogue that goes beyond conversation by involving certain qualities in which ‘participants display ability to listen, to be empathic and to open up to others’ argument and show a willingness to change their standpoint’ (Dysthe, Bernhardt and Esbjørn, 2013, p. 51; Linell, 2009). Our understanding of dialogue is, therefore, closely related to active participation and leans on how Norwegian professor in educational research Olga Dysthe links Bakhtin’s theoretical tradition of dialogue, which emphasises the multivoicedness of dialogue (see e.g. Bakhtin, 1981) with existential philosophy. It is always ‘We’ and not ‘I’ who create meaning through dialogic interactions. The other inspiration for our concept of dialogue is the Brazilian educator Paulo Freire’s political pedagogy. For him, dialogue was the starting point for consciousness-raising, which would lead to change (Dysthe, Bernhardt and Esbjørn, 2013; Freire, 1970). The third is John Dewey’s pragmatic approach to knowledge, as constructed in practical activities in which groups cooperate within a cultural context (Dewey, 1934, 2007).

In this chapter, we discuss how museum professionals engage dialogue when integrating participatory approach, methods and tools into their participatory practice. We describe a participatory design (PD) process related to the exhibition *FOLK – from racial types to DNA sequences (FOLK)*, which opened at the Norwegian Museum of Science and Technology (NTM) in March 2018. The participatory project involved a group of 11 young people 12 to 18 years old from a multi-ethnic suburban area of Oslo. The participatory project was centred on developing a digital activity connected to the exhibition. Before coming to the museum, the young people had already been members of Grorud Youth Council, a district advisory body which advises on community issues. The participatory process was managed by a participatory team within the museum, consisting of one curator, a museum pedagogue and one interaction designer from the exhibition team together with a researcher from a partner university. The participatory team planned the workshops and collectively facilitated them on the basis of their various competences. The participatory process lasted for a period of ten months and included eight workshops. The data collected in the PD process were recorded during the workshops by the authors and participatory team. The video and audio files, alongside reflection notes and written diaries, were shared within the team. Between the workshops, we communicated with the participants on Facebook (FB). We used a closed FB group to share not only plans for each workshop but also tips for sound-databases, editing

tools and so forth. This chapter is based on analysis of these recordings and notes and emphasises the development of purpose, the new judgements, understanding (dis)continuities of participatory practices and the adjustment of practice between each workshop.

The exhibition *FOLK* explores historical and contemporary research on human biological diversity through its interactions with society, culture and politics. The curatorial research interweaves understandings of individual and group identities with broader political and ethical issues, such as concerns on migration, the rise of racist and discriminatory attitudes or indigenous peoples' rights. Therefore, the topics of science, identity and belonging were the starting point for the participatory team, which focused on the making of a visitor activity. Parallel to this participatory process, the exhibition team organised multiple encounters with focus-group workshops, public lectures and roundtables. All these meetings aimed at fostering dialogue between museum professionals and individuals or social groups outside the museum, and at creating communal spaces on a topic with difficult history and high contemporary societal relevance to Norway and more broadly to Europe. Here, we focus on the process of the ten months collaboration and co-creation in the participatory project.

The outcome, a digital installation inviting museum visitors to mix, record and edit sounds that express the diversity of human emotions, was placed at the entrance of the *FOLK* exhibition (Figure 4.1). The installation was given the title *The Sound of FOLK*, which reflects the exhibition title, *FOLK – from racial types to DNA sequences*. Almost all museum visitors, alone or in groups, encounter the digital installation when entering the museum. It invites adults and children to listen and create soundscapes describing an emotion they choose out of eight categories. The soundscape they produce, for example, a soundmix of an ambulance siren, a baby crying and a sigh expressing the emotion fear, is uploaded to an archive, together with a written text and a picture or an avatar that describes the sound. The sound installation aims to strengthen the dialogue among visitors, by either creating soundscapes together or by listening to other people's contributions on the tablets or under the sound shower. During the formal learning activities, the installation is used to connect with the exhibition themes on human biological similarities and differences. The students are asked to explore the exhibition and make a soundscape that expresses an emotion connected to an object of their choice. The educator uses these stories of sound, for example, of how a poster from a human zoo in London in the 1830s elicits sadness or surprise, to facilitate dialogues around the exhibition topic.

The chapter addresses the relationship between co-production of the installation and dialogue with participants in the participatory process. We focus on three levels and three forms of dialogue that the participatory



Figure 4.1 The digital installation *The sound of FOLK*.

Note: *The Sound of FOLK* was developed during the participatory process. The museum staff collaborated with a group of 11 young participants over a period of ten months. The installation is placed close to the entrance of the exhibition *FOLK*.

Source: Photo: Håkon Bergseth.

team engaged in. These dialogic practices were necessary to retain the commitment and motivation of the young participants while ensuring that the design process developed according to the time frame of the exhibition process. The three levels of dialogue refer to the actors involved, who took part and from what positions. The participatory team managed dialogues with:

- The young participants during the workshops and in between the workshops.
- The participatory team summarising the workshops and planning the next steps of the process.
- The main exhibition team, reporting from the participatory process and adjusting decisions on content, form and levels of communication on the basis of the work with the young participants.

The dialogues were both discursive and practice based, as the encounters in the participatory process were based both on discussions of concepts and on experiences of diversity and identity, as well as on collaborative and creative activities. We have organised the forms of dialogue in three axes:

- Discursive; discussions, narratives, conceptual mapping and conceptual clarifications.
- Collaborative and creative activities, media production, model building and so forth.
- Voting, testing and evaluating on material outcomes.

Our analysis in the chapter focuses on how these levels and axes of dialogue were sources of the museum professionals' reflection and reflexivity that was crucial for grasping and supporting the participatory process. The research question we draw attention to is: what are the main challenges of making dialogues work, and what reflections are created during participatory and co-productive processes in museum exhibitions? The chapter focuses on the dialogic work and reflections of the museum staff involved in the participatory team.

Co-production, dialogue and reflection in the participatory museum paradigm

Audience participants' involvement in exhibition design requires creating a shared and neutral space for both museum staff and non-museum employees (Mygind, Hällman and Bentsen, 2015). Many participatory museum projects fail to overcome institutional power structures and relations and the result of the process is controlled by the museum (Lynch and Alberti, 2010). Participation and dialogue thus is a matter of museum professionals appropriating participatory methods adjusted to the situated context of the museum, the topic of the exhibition, the participants and the communities in question. This appropriation is a matter of translations – of re-ordering relations and 'drawing things together' (Björgvinsson, Ehn and Hillgren, 2012; Suchman, 2002). It necessitates temporal and transformative processes of finding new ways to make judgements, to understand (dis)continuities and to adjust practice. Participatory processes in museums, as in other organisations and institutions, include processes of staff becoming participatory designers through enactments, dialogues, collaborative learning and understanding. This is a process of becoming, where matters of concern relate to appropriation of participatory methods and its outcome (Stuedahl and Smørdal, 2015). These processes are strengthened if the organisational infrastructures support this becoming, which is not always the case (Dindler and Iversen, 2014; Pihkala, 2018; Saad-Sulonen *et al.*, 2018).

Visitor participation in museum exhibition design is also a form of co-production. Helen Graham argues that this co-production tries to overcome the access barrier of the glass case of the exhibited museum object by expanding the variety of people and objects that are involved in museum practice (Graham, 2016). Graham illustrates how this expansion by co-production collides with the stabilisation processes needed for museums to legitimate their work. Co-production, participation and community involvement in museums in this way challenge the limits of the glass case exhibitionary complex (Bennett, 2006), and the museum performs simultaneously 'the desire to expand the number of people involved, while seeking to retain, and even stabilise, museums' political assumptions' (Graham, 2016, p. 4). This double move of pluralisation and stabilisation can become problematic. It questions the assumption that museums' legitimacy necessarily originates from making 'objects' publicly accessible through display rather than by cultivating responsive and reciprocal relationships with specific people and community groups (Graham, Mason and Nayling, 2013). Museums, Graham suggests, could benefit from adopting *relational ontologies* rather than particularity or abstraction. This includes viewing participation as a way to conceptualise the relational state of things, people and events in participatory processes. It also includes viewing *translations* as a concept that captures the dialogues and interpretation work involved in participation (Graham, 2016; Latour, 2005; Treimo, in press). Graham's insight into the double move between expansion of knowledge perspectives and stabilisation of museum legitimacy gives an indication of what goes on behind the scenes of museum participatory processes and dialogues with visitor groups.

Participatory practice, dialogue and co-production of exhibitions require embracing uncertainty, which is often experienced as in conflict with the needs for certainty built into the operating values of the museum (Morse, Macpherson and Robinson, 2013). The challenges are multiple; participatory practices go beyond the competencies of the museum professionals, where dialogues have traditionally been mediated by the exhibition or in guiding tours. Participatory practices require an often-missing shared organisational strategy and a proactive plan for managing cultural differences between staff, visitors and societal context. Further, participatory practices require acceptance to partial submission of authority by museum staff, as well as aligning personal agendas and emotions according to Mygind (Mygind, Hällman and Bentsen, 2015). Acceptance may bridge the gaps between intentions and realities of dialogues and co-production between museum professionals and participating visitors, but requires awareness of how one's own analytic framework influences interpretation and actions. This requires reflection and reflexivity.

Reflections during the design process has been the central topic of Donald Schön's (1987) argument for understanding design as a reflective

process. Schön has been studying professional designers in several domains to articulate common elements in their practices. He states that designers' knowledge differs from everyday actions because designers reflect in action; the designer may even respond by reflection in action; by thinking about what she is doing while she is doing it, in such a way as to influence further doing (Schön, 1987). This gives us an interesting departure point for discussions on participatory design in museums, as it turns the focus towards museum staffs' reflection on procedural activities in addition to objects and artefacts.

Sociological and anthropological literature abounds with defences of, and challenges to, reflexivity. It is impossible to do justice to such rich insights in this limited space, so here we will attempt only to sketch how central methodological concerns on reflexive interpretation in the social sciences resonate with the practice of understanding in participatory museum exhibition design, as well as in other participatory projects. Reflexivity has gained much currency through a renewed interest in the sociological work of Pierre Bourdieu and his focus on undermining dualisms such as objectivism/subjectivism and structure/agent (e.g. Bourdieu and Wacquant, 1992; Bourdieu, 2000). Weber differentiates between being reflective and reflexive in research as a matter of whether one focuses on scrutinising 'the assumptions, biases, and perspectives that underlie one specific component of our research' or 'all components of our research, and in particular the interrelationships among them', respectively (Weber, 2003, p. vi). While the part of being reflective resembles what Schön calls reflection-in-action, being reflexive relates not only to the researchers' own process but also on how they are situated in a context where both their research arena, institutional relations and disciplinary background play a role in their work. In this case, reflexivity allows the reflection-in-action to include analysis of how contextual relations influence the design work.

However, there is also a difference between reflexivity in research and reflexivity in design. Research has developed tools for studying and describing, whereas in design, these tools do not fully support the work of creating new design objects. 'Design is intentional; therefore, design interpretations are also intentional. It is intention that predisposes us towards certain data and values. This means that interpretation cannot be done without an understanding of a direction – without desiderata' (Nelson and Stolterman, 2003, p. 156). Nelson and Stolterman (2003) suggest that even in the most objective approaches in design, such as engineering design, there is still a need for interpretation:

Interpretation, as a part of the design process, serves the same purpose as evidence and proof does in science. Interpretation is part of our

attempt to grasp the conditions and context that exist and will set the stage for our ideas and new design.

(p. 154)

The concept of interpretation with a direction gives a special character to the dialogue and reflexivity in a participatory design process (Stuedahl, 2004). Implementing a reflexive methodology in PD design means, therefore, to be aware of the intentionality behind interpretations and translations in dialogues. This reflexivity also includes the theoretical, disciplinary and institutional context of intentions and interpretations.

Participatory design competencies in museums as reflection-in-action

In participatory design (PD), facilitating participatory processes requires knowledge and structures that support the open-ended process of continuous dialogue and co-creation between designers and external participants (Björgvinsson, Ehn and Hillgren, 2012; Ehn, 2008; Dantec and DiSalvo, 2013; Hillgren, Seravalli and Emilson, 2011). It is important to focus on the designer using the method, and on that we cannot know participatory methods without the person or people enacting them (Light and Akama, 2012). This includes the practitioner's characteristics, the worldviews, purpose and decisions made on the way, as well as the moment-by-moment dialogues and shifts in position, focus and delivery that form the fundamental elements of PD facilitation.

Schön's reflective concept described the process of the designing as a conversation with situations: in a good process of design, the conversation with the situation is reflective. In response to the situation's back-talk, the designer reflects in two ways: reflection-on-action and reflection-in-action. Reflection-on-action is a retrospective on the construction of the problem, the strategies of actions or on the model of the phenomena, and may have been implicit in the designer's moves (Schön, 1987). The designer's reflection-in-action is interpreted as reflection during the design process. The understanding involved in the reflection-in-action is defined by changing activities: 'the unique and uncertain situation comes to be understood through the attempt to change it, and changed through the attempt to understand it' (Schön, 1987, p. 132). For museum professionals working in PD processes, reflection-in-action may revolve around understanding how participants engage – or not – in a collaborative process, and changing activities according to the development process.

In the museum context, reflection-in-action is about trying to grasp the participants' understanding of the project. Users' or participants' interpretation

and understanding may differ from museum staff's. The museum staff should be able to take the users' understanding as their departure point: 'by taking the meaning of Others as a fundamental starting point for design, designers must proceed from their understanding of users' understanding, which is understanding of understanding, or second-order understanding' (Krippendorf, 1995, p. 149). In participatory museum exhibition design, this brings awareness to how curators develop the competencies needed for analysing plurality and complexities, reflecting on these and conveying these into strategies of exhibition design.

The shifting of perspectives is a characteristic of dialogic practices, as dialogue requires reflexivity and positionality in the 'We', which both assume that the participants in dialogue are aware of their position and are prepared for this to be negotiated. Facilitation of shifting perspectives in PD is a competency which can be achieved only in dialogic practice and is what we have earlier framed as 'matters of becoming' (Pihkala, 2018; Stuedahl and Smørdal, 2015). This dialogic practice includes front stage (e.g. workshops) and back stage relations; exploring, creating and consolidating working relationships; creating attention and support around an exhibition topic; and investing time in dialogue with participants in order to build common understanding (Dindler and Iversen, 2014). The dialogic perspective requires an emergent lens to the participatory processes as well as to the institutional patterns and practices in museums to be able to connect the diverging purposes and focus involved in participatory processes (Arnstein, 1969).

The challenge is to find the tools and techniques for dialogue and awareness, which enable the voices of the participants to be valued at a level equal to that of the museum professionals (Tzibazi, 2013; Stuedahl and Skåtun, 2018). Giving authority and legitimacy to young audience groups in the design process may challenge the professionalism of the museum professionals if they are not seeing the intentions of dialogue, negotiation and critique as a means of developing meaningful alternatives (Smith and Iversen, 2014). A participatory approach that includes audience in the curatorial process, such as in the conceptual, operational and evaluation phases of exhibition design, would also require a common agenda and integrated methods on all levels of the museum organisation (Taxén, 2004). However, a common agenda can have different meanings to the different participants involved.

Making PD at the museum dialogic

When the museum participatory team engaged in the co-production project, they kept dialogues cross-axes of departments and disciplines, responsibilities and interests. The participatory team reported to the exhibition group

consisting of 17 museum professionals and an external designer, while 30 experts and students joined in during the two-year exhibition development. To this aim, the participatory team was established consisting of curator, educator, interaction designer and researcher. The curator had to report and *legitimise the participatory process*, both towards the exhibition project group and to the museum management. While the exhibition group recognised the importance of long engagement to increase ownership of the participatory process and interweave different perspectives, the participatory process with the young people started at a point when curatorial themes were beginning to settle. Therefore, the participatory team experienced more pressure when arguing for the open-ended nature of the participatory process. As the curator recollects:

We do not think that the management level really knew in detail what we were working on. They knew we had invited a group of young people from Grorud but not how it was organised and facilitated. The exhibition project group had good insight in the process, and gave their consent, but they still only had the knowledge we translated.

(interview with curator Ageliki Lefkaditou)

The curator argued for the participatory process as a way to research peoples' opinions (and experiences) on the topic of human diversity and belonging, and to expand the scopes and perspectives on content, form and communication in the exhibition.

The aim of the participatory team was to work with a group of young people who had a special interest in the exhibition topic. At the same time, the team wished to avoid the common approach of representation as a starting point for participation in projects under the auspices of intercultural dialogue policies and initiatives, and thus single out the specific groups as multicultural youths. The participatory team made contact with Grorud Youth Council, a youth organisation in the Grorud suburb of Oslo, through a youth umbrella organisation. The organisation had a special attention towards active citizenship and youth participation on several levels in society. The Grorud district is a multicultural residential area with among 50% immigrant citizens, consisting of first-, second- and third-generation immigrants. The six boys and four girls, from 13 to 18 years, who came to the first museum workshop had various backgrounds, and a common engagement and consciousness of being a young person in a multicultural district.

The facilitation of roundtable dialogues was shared within the team, and facilitation of collaborative dialogues in workshop activities was distributed among team members throughout the eight workshops, which we present later on in this section (Figure 4.2). After each workshop, the participatory

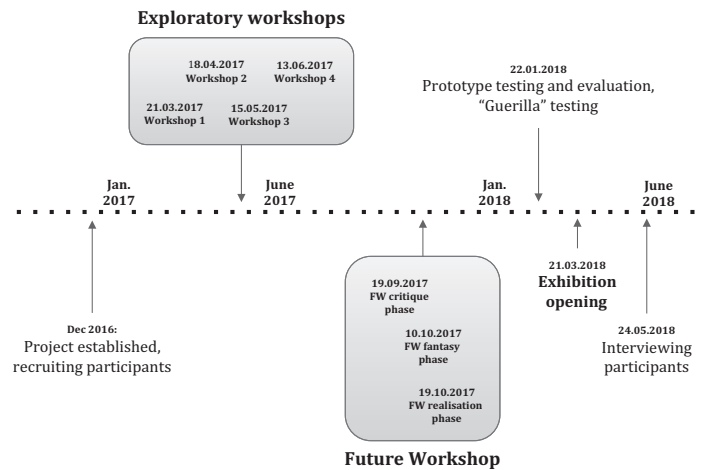


Figure 4.2 The participatory process of *The Sound of FOLK* lasted over eight workshops.

Source: Illustration: Tobias Messenbrink (2018).

team debriefed on the outcome of the workshop, and discussed next steps in the continuation of both the participatory process and the design.

In the PD meetings with the young people, the museum participatory team struggled to grasp the participatory practice and to redefine their roles related to the open-ended character of the process. They started with several potential design outcomes – an exhibition activity, an educational activity or an installation – and had to make sure that diverse professional agendas, responsibilities, demands for certainty concerning time, human resources and funding were aligned. While they had to be focused on the outcome of the PD process, they were also responsible for keeping the participatory process open, given the uncertainty of how the young participants would understand the complex topic and content of the exhibition.

The participatory team decided to focus on a sound activity that created the opportunity for audience creation and contribution to the exhibition, while avoiding privacy concerns. The team argued that sound would complement the predominantly visual communication of human biological diversity prioritised in the exhibition. We *see* difference, but what does *hearing* difference entail? This double focus on exploring a new medium – sound – and its potential for participatory activities, as well as on grasping young people's

understanding of science, identity and belonging, formed the basis for the eight workshops of the participatory process.

The first three workshops concentrated on the young people's literacy with sound and narratives of identity and belonging. The dialogues were facilitated through concept mapping, and the production of audio dramas showed the diversity of descriptions and the blending of cultural and biological markers of the young participants' identities. The group discussions focused predominantly on how cultural understandings of similarity and difference are embedded in everyday contexts. However, in the debriefing sessions, the challenges identified were multiple. The museum professionals reflected on the process being too open, and that the link to the exhibition theme became too vague. They worried that dialogues on such a complex topic without having the actual exhibit open may be too demanding for the participants. They also recognised that while most of the young people were well-versed in discussing issues related to racism, discrimination or belonging, they had problems relating such considerations to the *role of science*. Still, the team agreed that working in an open-ended manner also had a purpose of giving insights into how young people from a multicultural district reflected in words and actions about identity and belonging, as well as on how they would like to engage with these issues in a museum. This would have not been accessible in other ways.

The fourth workshop focused on presenting the exhibition work and the collaborative production of stories related to defined objects chosen for the exhibition. Nevertheless, after the fourth workshop, the participatory team still struggled with the open-ended process and became uncertain of the young people's engagement. One critical reflection was that the participants took a student role and delivered assignments and responded as if they were in school. They still had very little understanding of what a museum activity (or a museum practice!) is, and it was challenging for them to envisage how an unfamiliar topic could be communicated in an unfamiliar space. Faced with these challenges, the participatory team decided to change strategy. They put more emphasis on collaborative dialogues and activities related to developing a prototype focusing on identity and belonging.

The team decided to try the Future Workshop (FW) method in the fifth participatory workshop. This is a method developed in the 1970s by Robert Jungk, Ruediger Lutz and Norbert R. Muellert (Vidal, 2005) to facilitate group-dialogues and find solutions to social problems in urban planning projects. The method was developed especially for people without experience in creative processes and consists of five phases: *preparation phase*, *critique phase*, *phantasy phase*, *realisation phase* and *evaluation phase*. The FW was adjusted to the participatory process, and the team decided to focus on the critique phase, phantasy phase, realisation phase and evaluation

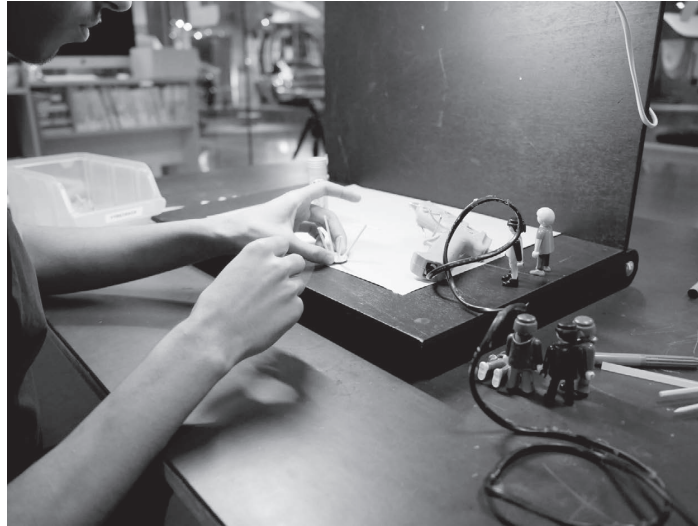


Figure 4.3 Future Workshop, the phantasy phase.

Source: Photo: Tobias Messenbrink.

phase. The participatory team redefined the previous four exploratory workshops as being the preparation phase. The facilitation of participatory workshops was also discussed, and it was decided to have one clear facilitator for each session. The educator would lead the fifth workshop. The design researcher would facilitate the phantasy phase, while the sound designer would be responsible for the realisation phase and prototype testing in workshop seven. This choice reflected a need for structuring the process, and start focusing on a final design outcome and a product that would be reliable.

For the critique phase in workshop five, the whole participatory project group visited the exhibition *Typical* at the Intercultural Museum in Oslo. The exhibition used a variety of interactive installations and textual statements to examine the concept of prejudice. This topic resonated with the themes the participatory team tried to raise in the previous discussions with the young people. During the visit, the young participants and museum professionals discussed experiences with different forms of exhibition engagement with the topic in this specific exhibition.

Workshop six, phantasy phase, focused on drawing a picture of future possibilities. It took place in the makerspace at the museum and the participants

worked in groups of three, involving museum staff and young participants. Each group developed a scenario for a potential museum visit that made use of sound and touched upon the themes of identity and belonging. A range of materials was available to enact their scenarios on a small wooden stage. The dialogic collaboration levelled the power relations between participants and museums professionals, as dialogue was easier while collaborating and looking down at a stage than by making eye-to-eye contact around a table. The group engaged in a long discussion on the kind of sounds used in the installation, and what they would express. They decided that the installation would invite people to reflect on the connections between sounds and emotions with individual and cultural identities and thus offer another view on human similarities and differences. An FB vote was arranged to decide which model would be developed further in workshop seven, the realisation phase. A prototype of the installation, based on the FB voting session, was discussed in workshop eight, the evaluation phase.

Dialogues and reflections during and after the participatory process

The dialogues and reflections that emerged during the participatory process can be explored on the basis of Graham's dilemma between pluralisation and stability. We suggest that this could be seen as a dialogic process of changing standpoints, listening and being emphatic and open to the multi-voiced arguments of the participants. Our experience suggests that stabilisation comes through continual adjustment. The awareness of this complexity in roles and movement through dialogic reflection-in-action allowed the participatory process to move forward.

Keeping the process open was a strategic choice, despite the challenges it elicited for the participants and for the main exhibition group. This openness required that the participatory process was discussed and evaluated constantly in relation to the multivocality that the participants brought in, as well as the needs of the exhibition group. The reflection-in-action that the participatory team made during, and after, in de-briefing dialogues, was focused on how to organise the dialogue with the young participants as well as with the exhibition group and the topic of the exhibition.

Reflections on participatory dialogue, engagement and adjustment of method

Much of the reflection-in-action of the participatory team centred on the dialogue with the young participants and their engagement in the participatory process. The thematic refocusing of the process from an emphasis on

scientific perspectives to familiar, everyday situations and the structuring of the whole design process around the participants' interest in the medium of sound were the most important strategic changes to ensure the participants' continuous engagement.

The participatory team was also concerned with creating an environment that would empower the participants. This required being empathic to both the young participants' experiences of the museum space and the participatory process. All workshops took place in a room dedicated to experimental exhibition making outside of museum working hours, which meant that the young people did not get to experience the museum in full activity. However, the workshops started with joint dinner and conversation on more general topics to enhance the feeling of safety and common purpose. The participatory team noticed that the young people quickly became familiar with the space and seemed comfortable and safe.

The participatory team discussed whether an alignment of motivations was needed to maintain the participants' engagement. The museum professionals aligned around the common purpose of creating a participatory activity, but the participatory team wanted to address more emphatically what the benefit could be for the young people. Therefore, they prioritised presenting the museum exhibition process and revealing different aspects of working in a museum. Some of the young participants expressed that coming to the museum in the evening gave them a feeling of belonging to a valued group and that their views were important.

The introduction of the Future Workshop (FW) method gave all participants a common and structured understanding of the outcomes of each workshop and introduced a methodological framework that assigned equal roles to the participatory team and the participants. It also legitimated the continuation of the time-consuming participatory process towards the museum exhibition team, by adding a concrete, acknowledged scientific method to the process. The dialogues during the workshops became more structured and the participatory team could focus more on ensuring engagement than struggling with uncertainty on all levels. In this sense, the FW method became a stabilising factor that allowed pluralisation.

By the end of the process, the participants were pleased to see that their ideas materialised in the installation. They also expressed that the participatory process gave them insight into the workings of a museum and an understanding of the complex processes of exhibition making. The museum had no previous established strategy for community participation or dealing with cultural diversity. While not foregrounded during the process, the museum professionals worked on opening up a discussion about diversity at the museum and arranged to hire some of the young people as explainers

during the summer season. These outcomes point to how reflexivity on the whole participatory process may affect engagement during the process itself and beyond it.

Dialogue and reflections of the outcome of the participatory project

The slow shift in how the participatory project engaged with the exhibition's topic required reconfiguring the project's contribution to the exhibition. The activity with the sound installation focused on identity and belonging and was complementary to exhibition themes but did not reproduce them. The sound installation could encourage interaction and dialogue, allowing visitors to experience an easier and familiar entry to the exhibition that is more demanding and dense in content. As the time of the exhibition opening was approaching and the whole exhibition group was becoming anxious to see the outcomes of the participatory process, stabilising this aspect of alternative entry became important.

The participatory group realised, however, that while the theme of the exhibition was becoming easier to grasp in the sound installation, its connection and contribution to the exhibition's topic appeared weaker and more abstract. A reason for this may be that the user-generated soundscape was not integrated as part of the exhibition narrative (Galani and Moschovi, 2013). When the sound designer presented the prototype to the exhibition team, they suggested a number of adjustments to create visual coherence with the exhibition and to showcase the different ways humans express their emotions on human diversity.

The new relationship to the exhibition, however, led to another strategic translation regarding the spatial relations between the exhibition and the installation. During the Future Workshop (FW) process, the participatory team had to consider the best position for the installation to open reflections and dialogue on the exhibition topic, the limitations of space within the exhibition, and the request of the exhibition's designer to keep the room contemplative. An interactive activity based on sound did not align well with the overall atmosphere of the show.

The participatory team responded to these new challenges by experimentally placing the activity at the foyer space of the museum. For this decision, they relied on recent museum research, which points to the multiple transformative functions of the foyer space (Laursen, Kristiansen and Drotner, 2016). While this decision was motivated by the intention to prepare the visitors through a broader and more familiar topic, the response from the visitors was lower than expected. Therefore, the activity was finally moved right outside the exhibition entrance.

Dialogue and reflections on the exhibition topic in the participatory project

The participatory team tried several times during the four first workshops to open up an explicit dialogue about how science interacts with conceptions of identity and belonging through the concepts of race and ethnicity. This seemed to engage the young participants less than discussions on daily life and their own experiences with identity and belonging. The initial theme made more sense to the experts, and the participatory team reflected extensively on whether they should insist more on focusing on science.

For example, while the curator noticed that a commercial DNA testing kit attracted the participants' interest and could become a good entry point for discussing issues related to nature and nurture, she did not bring it back to the dialogue. This was a result of inexperience and fear of dominating the discussion, as well as a conscious choice to follow on what emerged as more relevant for the participants. The participatory team decided that they were not interested in replicating the voice of the exhibition, but in embracing other perspectives even if they appeared to be leading astray from the original themes.

The title of the participatory project, *Science, Identity, and Belonging*, did not change in any of the documents or in the group's social media account. Even if the focus on science became less obvious, this reflected the wish of the participatory team to hold on to it as a possibility. Meanwhile, for the curator, the introduction of the Future Workshop (FW) process gave the focus on scientific practices a return, but in another, more subtle, form. The FW introduced a scientific method of structured experimentation, and the focus on science was translated into a focus on scientific method:

With the FW solution, that's where we left the original focus on science and moved to the idea towards emotions expressing the themes of diversity, identity and belonging. However, we engaged with conscious experimentation. Though we left science, our method became more scientific: By experimenting with FW as a method of inquiry, we established an experimental zone, we became co-researchers and even redefined our research questions.

(interview with curator Ageliki Lefkadiou)

Finally, the participatory team redefined the focus on science, society and culture – after consultation with the whole exhibition group – without changing the design outcome. For example, they translated the number of categories of emotions available for the visitors to create soundscapes to be related to research in social psychology and anthropology of emotions

and a critical positioning (Messenbrink, 2018). The participatory team also discussed if the re-focus resonated with research on the role of emotions in constructing group identities, belonging and origins as well as in processes of racialisation, discrimination and exclusion, to be found in social scientific research.

Concluding thoughts

This chapter explores how reflection and dialogue during participatory processes enable museum professionals to sustain engagement and to make translations necessary for exhibition design on difficult topics such as belonging and identity for young individuals with diverse backgrounds in Norway/Europe. While an exhibition design process requires a final product within given institutional frames and deadlines, co-production and multiple voices flourish with openness and investment in long-term processes. Our research suggests that this tension between stabilisation and pluralisation is a creative one. Reflection-in-action over the whole participatory design (PD) process allowed the museum professionals to acknowledge that stabilisation is only momentary and in dialogue with continued movement. The explicit discussions of the challenges that the topic posed for the participants brought an awareness of the complexity of roles, motivations and agendas in the participatory process and made it possible for the museum professionals to reflect on reasons for what the participants could contribute and what they could not.

When the interdisciplinary participatory team embarked on this project, they were faced with an unfamiliar practice and the lack of supporting arguments for PD at the museum. They struggled with establishing shared understandings and language, with achieving participatory methods, situations and actions, as well as with being reflexive and ready to negotiate and change their perspectives. The PD process required adjustments in methods, in relation to the main exhibition, and ultimately in the prevalence of the specific exhibition topic in the outcome of the participatory project. It is through these translations and re-configurations that the museum professionals became participatory designers able to assemble, justify and defend the PD process.

Participation emerged through the appropriation of PD methods, tools and techniques, while the museum professionals benefited from the latter in terms of translating both purpose and supporting arguments for the participatory process. Within the PD process, different levels and forms of dialogue – among nested groups of actors and covering a range of discursive and creative activities – sharpened the interpretative skills of the museum professionals and structured the participatory process without

compromising its open character. The initial explorative workshops pushed them into being comfortable without having absolute control and clarity over the outcome of the project or the emerging discussions. At the same time, those workshops revealed the need for structuring elements such as the Future Workshop, which supported the project by providing a focus on a concrete outcome in the collaboration with the participants, as well as in the communication with the exhibition group.

We have shown how museum professionals implement participatory methods in their practice of audience collaboration and how they make dialogues work. We have illustrated how they reflect about the purpose of dialogues and how they co-produce knowledge with their participant groups, and how they adjust practices of designing visitor activities and exhibitions to hold the complexity of including other voices. The outcome of the PD process, the sound installation, was a more abstract invitation to visitor engagement with ethnicity, belonging and identity and was a result of museum professionals understanding how young people from multi-ethnic backgrounds think, engage and live with the topic. In this way, the PD process gave museum professionals insights that they would not have gained with more traditional audience involvement methods.

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5. Co-design as museum programming: engaging (non-visiting) youth in museum activity design

5.1 Abstract

A co-design process that holds the potential to facilitate museum engagement will be the topic of this article. I report from a series of workshops called ‘Science, Identity and Belonging’, during which a group of museum professionals worked together with young people to co-design a museum activity. The focal point will be the way engagement materializes in the meeting between museum and youths in a creative development process of a digital installation parallel to the making of a temporary exhibition. The co-design process in this case led to a product; a digital sound installation that complements and connects to the exhibition *FOLK – From race types to DNA sequences*. I will explore engagement throughout the co-design process, looking more closely at challenges and possibilities while considering that both the museum professionals and the young people brought with them their own engagement into the process. A core theme to address will be the way the meetings between youths and museum staff hold a potential to engage, and how during a long-term partnership other relations emerge. This will foster an awareness about ways of programming museum collaborations with the purpose of engaging youths in design of museum activities and programs.

Keywords: Co-design, Engagement, Science museum, Sound installation, Interdisciplinary, Dialogue.

5.2 Introduction

In the Science, identity and belonging (SIB) project I have collaborated with a group of 22 individuals creating a digital sound installation connected to the temporary exhibition *FOLK – From racial types to DNA sequencing* (2018-2019) (FOLK). Co-design has been used as a research method in designing the eight workshops described and analyzed here, as well as an approach to broaden the understanding of the connection between visitor and design processes within the science museum⁴⁴. I ask if

⁴⁴ (Macdonald, 2007a)

facilitating for creative processes involving museum professionals and researchers together with a group of young people holds potential to open up for a wider variety of visitor engagements. The necessity of time in the tension between letting go of control and retain a direction is equally important, to listen more closely to the needs of the collaborative partners – and, in a broader context, society as a whole.

Engaging teenage audiences is a challenge for museums ⁴⁵. This age group views museums as not relevant, and participating in educational programs is often not recognized as something beyond compulsory education ⁴⁶. For science museums the challenge is magnified, as science as a topic also fails to attract teenage school children⁴⁷. A suggested approach would be to focus on the user context while designing activities, as well as to recognize the implications of motivation, control, challenge, and collaboration. In this paper I explore the forming of such a longer-term relationship between the Norwegian Museum of Science and Technology (NTM) and a group of teenagers through co-design in the context of the SIB project. Together with other NTM staff I worked with a group of young people and external partners using a variety of design methods and tools to co-design a digital museum activity related to the FOLK exhibition. The design activities were structured in eight design workshops, and will be at the center of my reflections on museum engagement and what it means in the context of co-design.

The paper is structured as follows: section 2 discusses the engagement potential of co-design and its associated methods and techniques, with specific reference to science museums; section 3 presents background information on FOLK and SIB and the co-designing partnership; section 4 presents the co-design process for SIB; and section 5 discuss and concludes the paper with some reflections on the process and its possible effects on engagement.

5.3 Engagement and Co-Design in the science museum

⁴⁵ (Black, 2012b; Dindler et al., 2010b)

⁴⁶ (Dawson, 2018a; Kobbernagel et al., 2015)

⁴⁷ (Hadden and Johnstone, 1983; Osborne et al., 2003; Vossen et al., 2018)

Engaging within a museum setting can in its simplest and most traditional form be viewed as a two-way process of interacting with museum artefacts. Encountering a science museum can be a somewhat chaotic experience, where visual, textual and sound material compete for attention. Graham Black (2012) argues that one way of increasing the outcome of a meaningful interaction with an exhibition or program is to design for several layers of knowledge and possible approaches. This rests on an understanding of visitor engagement with museums based on the social contexts of their visit⁴⁸ and meets the visitor as a person with a set of competences, knowledges and motivations in the face of new experiences⁴⁹. Analysis of engagement in museums often focuses on learning engagements, fueled by an understanding of museum visits as meaning-making experiences that involve interactions with exhibitions and programs⁵⁰. For example, Bitgood's (2010) Attention-Value model frames the stages of engagement as incremental, eventually leading to deep engagement and learning. Bitgood's stages include 1) capturing attention, 2) focusing attention and 3) engaging with exhibits. DeWitt et al. (2019) take a different approach to analyzing engagement, focusing instead on ways of strengthened connections between a visitor's personal understanding of the displayed artefact and the stories told. In a similar vein Humphrey and Gutwill (2005) argue that, to support visitor engagement, museums should give visitors the opportunity to discover on their own and to feel in control of their own experience.

5.4 Science and society

Even so, what is it that we ask visitors to engage with in science museums? The scientific concepts and principles that are demonstrated in interactive displays and interpretive panels is one of the main intended objects of engagement. But a Science Museum is, among other things, an arena which can highlight problematic issues regarding science, both historically and contemporary. The objects and exhibits held by a Science Museum have the potential to engage with contentious themes beyond the scientific community⁵¹. Scientific insight is always a result of its time and context, but is often thought about as fact, contrary to the ethical considerations surrounding it⁵². Communicating science is complicated, as different perceptions of science and society

⁴⁸ (Falk and Dierking, 2000a)

⁴⁹ (Eardley et al., 2016; Falk, 2006; Leister et al., 2019)

⁵⁰ (Hein, 2002a; Hooper-Greenhill, 1999a)

⁵¹ (Alberti, 2017)

⁵² (Reiss, 1999)

exist simultaneously and no single correct understanding of science exists; rather, science understanding exists in relationship with culture, citizenship, and identity⁵³.

Museums can no longer claim the role as gatekeepers to the cultural memories of human history⁵⁴, with the task of transmitting an objective understanding of the past⁵⁵. The museum's responsibilities go beyond collecting lived lives through things and memories⁵⁶. Today these institutions are seen as spaces for dialogue, with the potential to be activist in societal change⁵⁷. Themes and collections can unfold along different axes, which hold different meanings for different people. To build such safe spaces, the science museum needs to acknowledge and address the existence of power relations, which may manifest in a space that is considered respectful and candid⁵⁸. A science museum thus holds the potential to be an inclusive space where new voices can speak for themselves only if viewed as a contact zone, a shared space not owned by the museum but co-habited by museum staff and visitors⁵⁹. A space that for all participants represents a diversity of opinions and agendas. Such sharing of power and decision-making is at the core of a participatory process, which requires that one must ask who makes the decisions. This differs from a planned learning activity where the participants are on the receiving end of museum practice. Participatory practices provide a possibility to support meaningful experiences through engagement⁶⁰ and can be viewed as a process where the group works together towards a common, but not pre-specified aim⁶¹. This does not mean that the museum can just take a step back and let the process happen; management and facilitation of the process are necessary⁶².

5.5 Designing with, not for

The participatory shift in museums is often described as an ongoing process, related to the shift towards an openness in the field of cultural heritage as well as in society,

⁵³ Sarah R. Davies and Maja Horst, *Science communication: Culture, identity and citizenship* (Springer, 2016).

⁵⁴ Michelle Henning, Sharon Macdonald, and Helen Rees Leahy, *Museum media* (Wiley Blackwell, 2015).

⁵⁵ (Roberts, 2014)

⁵⁶ (Dodd and Jones, 2014; O'Neill, 2006; Spitzer and Fraser, 2020)

⁵⁷ (Brekke, 2018; Sandell, 2016)

⁵⁸ (Katrikh, 2018)

⁵⁹ (Clifford, 1997; Kidd, 2014b; Lynch, 2011a)

⁶⁰ (Bunning et al., 2015a)

⁶¹ (Smith and Iversen, 2014)

⁶² (Govier, 2009)

encouraged by social media as a platform for sharing⁶³. When designing *with* and not *for* visitors, it is important to make sure that the process is rewarding for all participants. One crucial aspect is to recognize participants as equal partners and, in many respects, as experts who play a vital role in generating knowledge and understanding⁶⁴. Engagement in participatory practices of exhibition design can be understood as collaborative exploration, in contrast to traditional curation that is often a one-way design activity. A process where one investigates, reflects, creates and shares, and where mutual learning has the potential to happen between participants⁶⁵. Participatory Design (PD)⁶⁶ has been widely used in the field of designing user interfaces of digital applications and environments for over half a century. It can be traced back to the Scandinavian democratization of the workplace in the 1970s, a change that aimed to create better working conditions, and give workers the possibility to extend their skills throughout the ‘computerization’ of work⁶⁷. A comparable shift in approach is taking place in museums today, where the visitors who will be affected by the design, become active agents in the design process and are viewed as experts in their own experiences⁶⁸. Science museum visitors often expect to find simple, definitive answers to complex scientific questions. To bring forward questions that do not have simple, true-or-false answers but rather have answers that can be on an axis from ‘good’ or ‘bad’, depending on their moral/ethical framing in the context of co-design, can be a more thorough pedagogic approach to highlighting difficult scientific issues. Participatory processes allow time for participants to engage more thoroughly with the theme, and when they extend over a long period, other connections occur⁶⁹. Even so, viewing co-designers as beneficiaries of learning assigns the museum the position of teacher, and may compromise the agency of participants⁷⁰, and is therefore a line one needs to tread carefully. The above discussion points to a conceptualization of co-design in the science museum as an act of moving visitor engagement behind the scenes through a

⁶³ (Birchall, 2017)

⁶⁴ (Miles and Gibson, 2016; Modest, 2013; Tzibazi, 2013)

⁶⁵ (Sørensen, 2021)

²³ I will mainly use the term co-design, understanding it as a collaborative design process. It belongs in the tradition of Participatory Design (PD), although it puts a stronger attention to blurring the responsibilities between the members and the professional team (Ciolfi et al., 2016).

⁶⁷ (Simonsen and Robertson, 2012; Stuedahla and Lowe, 2013)

⁶⁸ (Taxén, 2004)

⁶⁹ (Olesen et al., 2020)

⁷⁰ (Winstanley, 2018)

production phase; a dialogic process which can blur the boundaries between members and outcomes as well as process⁷¹.

5.6 An exhibition and a co-design project:

The exhibition project FOLK (2018–2019) grew out of the cross-disciplinary international research project “From racial typology to DNA sequencing: ‘Race’ and ‘ethnicity’ and the science of human genetic variation 1945–2012”⁷². In the Norwegian context, the exhibition researched and displayed, among other things, the Sámi population’s subjection to racial research, and its impact as part of a harsh assimilation process around the 1920s. FOLK was developed in the museum LAB, a place and space for research and exploration on how knowledge processes emerge within a museum⁷³. In Norwegian public discourse the term ‘race’ is absent⁷⁴. As in other European countries, race in Norway is a shifting concept, which often hides behind the term ‘ethnicity’⁷⁵. FOLK⁷⁶ juxtaposed historical race science with contemporary genetic research on human diversity; the vision was to become an inclusive arena for the public to discuss such issues⁷⁷. It is an example of an exhibition concerned with controversial themes⁷⁸ which confronted visitors with earlier times’ research on biological differences – scientific racism – and the impact this has for racism in today’s society. The making of FOLK involved a cross departmental group, including two curators specializing in the history of science, technicians, museum pedagogues, programs managers and conservators. The co-design project discussed in this paper, was born out of the exhibition project. It aimed at contributing to the challenges FOLK had of displaying difficult and sensitive heritage; in doing so, it engaged young participants with the very essence of the issues that the exhibition explored. Originally the objective of the co-design process was to develop a learning program for FOLK in collaboration with a group of young people. However, the fluidity of the participatory process resulted in a completely different output to the one we had envisioned: a digital sound installation called *The Sound of FOLK*, as seen in figure 2 below, which was put on display in

⁷¹ (Brandt et al., 2012b)

⁷² <https://www.tekniskmuseum.no/folk/research/about-the-project>

⁷³ (Treimo, 2019)

⁷⁴ (Kyllingstad, 2017)

⁷⁵ (Balkenhol and Schramm, 2019)

⁷⁶ FOLK won the British Society for the History of Science Great Exhibitions Prize 2018 as “an outstanding example of how history and historical artefacts can be used to engage with present-day concerns”.

⁷⁷ (Stuedahl et al., 2021a)

⁷⁸ (Sontum, 2018)

connection with the FOLK and within which visitors could compose a soundscape that represented a feeling of their choice. The installation opened up for reflection on the diverse and similar way we express our emotions as responses to acoustic environments.

Figure 1. FOLK: An arena to interact and discuss. Photo Åsa Maria Mikkelsen

Figure 2. The Sound of FOLK installation near the entrance to the FOLK exhibition. Photos: Torhild Skåtun (left) and Håkon Bergseth (right)

The participants in the development of *The Sound of Folk* included a group of eleven young people from the Grorud Youth Council. Grorud is a multicultural district of Oslo, and the young people were recruited through the NGO Youth and Leisure Time,⁷⁹ an organization that works for the rights of children and young people to participate in decision making on issues that concern their world. Our participants were engaged as an advisory board for the district council, a position that is paid and includes certain responsibilities. Each participant received a honorarium for each workshop they participated in, in the same way they received a fee as delegates to the youth council of Grorud.

The Norwegian Museum of Science and Technology is situated on the outskirts of Oslo with around 50 000 schoolchildren visiting each year, of which one third attend learning activities annually. All our young collaborators had visited the museum with their school classes on several occasions, although only one had visited with his family. An interdisciplinary team⁸⁰ of three museum professionals and an external museum researcher worked alongside the young people.⁸¹

Case study: Designing ‘The sound of FOLK’

Over a period of eleven months, we facilitated eight workshops outside museum opening hours, on Tuesday evenings from five to eight pm. This timeslot was first and foremost chosen because all the young participants had their engagement with the advisory board of the Grorud Youth Council once a month on Tuesdays. Arranging the workshops at the museum also meant that the co-design activities were detached from

⁷⁹ Ungdom og Fritid (Youth and Leisure time)

⁸⁰ The team consisted of one of the curators and project leader of the exhibition FOLK, Dr. Ageliki Lefkadiou, a technician and masters student of Informatics at the University of Oslo Tobias Messenbrink, and myself, museum pedagogue at NTM and PhD researcher at the University of Leicester, UK, as well as an external museum researcher, Professor Dagny Stuedahl from Oslo Metropolitan University

⁸¹ The council boards member and students are anonymized in this paper.

school life, placed somewhere between leisure and school. All workshops took place at the NTM, apart from workshop 5, which was held at the Intercultural Museum of Oslo (IKM) for reasons that I will explain later. When we started planning the collaborative process in late 2016, it was a year and a half before *FOLK – From racial types to DNA sequences* was due to open. Before we met the youths, we had some thoughts about how and what to collaborate on, and which methods to implement to facilitate this collaboration. The choice to use the media sound as a complement to other media that were presented in the exhibition as historical and contemporary efforts to capture the biological differences between people. From March 2017 and during the following months, we arranged eight workshops (see figure 3 below). Before the summer of 2017, the workshops took place once a month, then three workshops during one month followed by a prototype test three months later.

Figure. 3. Workshop timeline. Illustration: Tobias Messenbrink

Our co-designers knew one another but were not as close as a group of classmates would be: there were age differences among the group, and they all attended different high schools. What bound them together was their engagement on the advisory board for their home district. As one young woman expressed;

I knew much about the political opinions of my partner Hamda, but little about her daily life (Catharina, 18 years).

Attendance in the workshops varied throughout, both in terms of who came to each workshop and what time they arrived. For example, at the first workshop, the six young people arrived between a quarter to five and half past five: This presented some challenges, such as having to repeat messages as there was no clear starting point. This pattern continued throughout the workshops. In addition, new people were coming in and others were dropping out, with the youngest not participating all the way through.

5.6.1 Workshop 1: Getting to know one another and the topic

When presenting the SIB project, we only had some historical photos and a few objects that connected to the upcoming FOLK exhibition. Figure 4 below shows the introductory activity where we asked participants to write down what they associated with the terms ‘identity’, ‘belonging’ and ‘ethnicity’. We chose to exclude the term ‘science’ despite it being part of the title of the project, because we thought that a good starting point for engaging would be to elicit perspectives that are recognizable and

connected to participants' everyday lives as pointed out by Mygind (2015). Next, participants marked with a star words that felt more relevant to them. Words like 'upbringing', 'how I look', 'feelings', 'passport', 'education', 'exclusion', 'color', 'residence', 'tradition' and 'beliefs' were among the most starred. Some of the participants found our semi-structured approach more informal than they expected, as this young participant expresses in this comment:

It was a little strange at the beginning, that it was that loose. You did not really know, you had an idea, but it was fine for us and very, very exciting. Felt that there came a dialogue and conversation out of it (Catharina, 18 years).

At the same time, excitement to be part of designing something real was pervasive in several interviews in the aftermath of the project. The main outcome of the first workshop was to set the scene for the co-design process, as we got to know each other and the theme. Our design partners did not find the use of sound as a reflective tool very exciting, and suggested that it should be accompanied by something visual. The task for everyone was to bring a sound from our everyday life to the next workshop, sounds that we are surrounded with.

Figure 4. Associating around terms identity, belonging and ethnicity. Photo: Tobias Messenbrink

5.6.2 Workshop 2: Sound and Introduction to Soundscapes

Seven young people came to this workshop, including three new participants, minus two of the youngest. One of the three new arrivals was a board member, two brought along a friend. The conversation picked up on the concept 'identity', 'belonging' and 'ethnicity', and several of our partners commented on how words connected to all or two of the overarching terms. The next step was to introduce the topic of FOLK. The curator focused on the science aspect and demonstrated the 23andME commercial DNA testing kit, an object that was perceived as more scientific. Next, we listened to the brought along sounds, to see if they sparked any thoughts and reflections related to our subject. When none of the young people came forward to share sounds, one of the museum team started off by sharing the sound of a Greek Orthodox Mass in Oslo, followed by a member played the sound of a heat pump, and then others played their recordings from bus trips and alike. Next, after an introduction to non-linear audio

editing and sonic interaction, our co-designers formed groups with the task of creating a layout for soundscapes.

All in all, we tried to do several things using a high tempo to maintain control, being a little uneasy that our co-designers would lose interest. After the second workshop, we also learned that Facebook was not sufficient as a platform for sharing and reminding participants about the activities in the project. A text message was sent out telling everybody that there was a new post on Facebook for them to check for invitations to workshop 3.

5.6.3 Workshop 3: Nonlinear audio recording

The third workshop gathered nine youths, all of whom had participated in at least one of the previous workshops (four had been to both). A post on Facebook gave instructions on how to record sounds and pointed to sound libraries such as freesounds.org, emphasizing that the aim was to have the sounds downloaded. All three groups had planned a storyline: two participants had communicated on Messenger deciding who was to record what sound, the other chose to use a sound library and searching online for sounds. We did not control who was to work with whom and presented the task very openly, wishing to keep an open, experimental space. All groups completed a soundscape using multitrack audio editing software on iPads. They were all different in content and storyline, revolving around themes like ‘life’, ‘equality’, ‘war’, ‘birth and death’, ‘reasons for moving’ and ‘likeness in spite of differences. Despite, what we experienced as a somewhat disturbed creative process, the sound-making young people remembered the experience as positive, as one expressed it in an interview six months later:

Sounds and to put them together and then making that soundscape, do not remember the whole task, it is a while ago, but I remember the sound was a little, very, very interesting (Hamda, 19 years).

We decided to set up a last workshop before the summer break, to experiment with pictures from the collection and how these could be connected to making stories with words. Objects and archive photos were placed across a table encouraging to take a picture with the mobile phone. The homework was to deepen the image with a text to be written before the next workshop, preferably on the mobile phone.

5.6.4 Workshop 4: Sound, object and space

Using the poll function that Facebook makes available; we provided three date options and then chose the date most people could attend. The homework this time was as follows: *Comment on an object from the exhibition (which you took a picture of last time). How do you relate the concepts we have talked about (science, belonging, identity and ethnicity) to this object? Record the comment on your mobile phone (approx. one minute).*

Six young people came to the fourth workshop, of which only one participant had recorded a comment of an archive photo (see figure 5 below) of a woman adult.

Figure 5. Kristine Bonnevie⁸², writing outside her cabin in the Norwegian mountains in 1931. Photo: Museum for University History, University of Oslo, unknown photographer.

He connected this picture to his own grandmother thinking her life resembled what was pictured and interpreted as simple life, that he thought his grandmother would have in his parents' home country. However, emphasis was on the technological elements surrounding her, such as a typewriter. Then we all chose one picture or an object and had five minutes to write a connecting text, and then read them aloud. It was noticeable that it was easier to connect to people on photos rather than objects, which nobody chose.

Eight months before *FOLK* was due to open, our co-design time was running out. We, the museum staff, now needed to find a way forward in the participatory project. We chose to use Future Workshop (FW)⁸³ as a method for facilitating a more structured engagement with the museum content. This method was originally developed as a way of empowering citizens on societal issues and taking an active part in processes of democratic problem-solving. FW consists of four stages; first the preparation phase, where the task to be solved is decided. It is followed by a critique phase, often through a brainstorming act of scrutinizing and framing the problem. Then comes a fantasy phase, where there are no constraints regarding possibilities and funding for solving the problem. The last phase is implementation, where the ideas are evaluated based on their

⁸² Kristine Bonnevie was a zoologist and Norway first woman professor. She was director of the Department of Heredity Research from 1916, a time when human genetic was strongly interweaved with eugenics. See Kyllingstad 2018 (<https://www.uio.no/english/research/news-and-events/events/guest-lectures-seminars/science-studies/jon-kyllingstad.html>)

⁸³ (Jungk and Müllert, 1987b; Muller and Kuhn, 1993; Vidal, 2005b)

practicability. We decided that we needed to understand the youth participants relations to museums and interactive experiences, to be able to continue the co-design process.

5.6.5 Workshop 5: Critique phase

Our first meeting after the summer was right after school had started and before the Grorud Youth Council had held their first meeting. The oldest participant in the group was about to start university and their assignments as part of the advisory board were about to end. We therefore invited three new participants into the group. Two young students that worked as explainers at the Museum, and one master's student in museology at the University of Oslo, who was doing an internship at the museum.

Figure 6. Exploring Typical them at the intercultural museum in Oslo. Photo: Tobias Messenbrink

Considering that the FW preparation phase had been conducted through the four first workshops, the newcomers were thrown right into the critique phase. We met at the IKM. There was the exhibition *Typical!* on display with a theme that had similarities with *FOLK*, addressing themes such as 'otherness', 'categorization' and 'presumptions'. Focusing on the interactive parts, we found things we both liked and disliked, illustrated by the following comments from the participant:⁸⁴

...I am not that happy reading several pages, so I really liked to watch films and solve practical tasks. (participant, 1).

I think it is very nice that even if we are different people, it is if as all have found something they like... and that it can be individual and social (participant, 2).

What I think was good is that you have to move to get the information you needed... that engaged me... personally. (participant, 3).

After spending an hour in the *Typical!* together with the IKM museum educator, she accompanied us to the lunchroom. We experienced more focus on the positive aspects of the interactive installations than on the negative. However, even though we went around the table twice expressing negative and positive elements, it was difficult to

⁸⁴ Reflections in notebooks were handed in anonymously after the workshop.

steer the reflections towards the characteristics of a good interactive experience, which was our aim. As the quotes express, the exhibition gave an overall positive experience, as everyone found something they liked and understood, even though there were elements that were not that easy to capture. However, we did not manage to pinpoint the best interactive experiences.

5.6.6 Workshop 6: Fantasy phase

This workshop focused on the FW Fantasy phase and took place back at the NTM in the Maker Space Area. Everything was allowed, we pretended to have all the money in the world and that there were no physical laws. This time three participants from our original group, the Grorud Youth Council, came to the workshop. We placed them in three different groups and designed three user scenarios where interaction with sound was central.

Figure 7. Fantasy phase: creating future digital sound scenarios with equipment from the Maker Space toolkit, like straws, pen, paper, recorder, Lego and Playmobil figures. Photo: Tobias Messenbrink

We used toy figures as building blocks, together with straws and drawings to make a scene. Three scenarios were created through dialogues and negotiations, moving figures around to depicting buses, domes, interactions, and spaces. The task was to design a visitor journey, and the facilitator (the external researcher) moved around asking questions and putting objects in the scenes.

The following three scenarios were developed:

Scenario 1. Visitors upload a favorite sound it to the museum cloud before they go to the museum, from home or in the way. On site all visitors must pass through the FOLK exhibition where the uploaded sound can be found together with many other sounds.

Scenario 2. A group of people with a special interest in sound. They do not find the exhibition, but they do find a sci-fi dome at the museum. There is nothing but sound, sounds from different places around the world. The idea is to not only make or record sounds, but to bring the whole world to Norway with sounds.

Scenario 3. One person got a tip about the FOLK exhibition, for example through social media. In a sound cloud information appears as a cacophony of

sounds that is not understandable, with the question ‘what is sound?’. The person makes an appointment to visit the exhibition with a friend.

5.6.7 Workshop 7: The implementation phase

This workshop had a focus on the ideas that had materialized during the former workshops. This time, two of our collaborative young people came, together with the explainers and a young woman working on a day’s assignment at the museum. We chose the dome model from scenario two for further development. An interesting consideration that came up among the teenagers was that to be associated with the museum was experienced as embarrassing among peers. After a while, we figured out that to have visitors bring their own sound was rather complicated, and we decided to use a sound archive that connected to feelings instead. Additionally, the connection to sound and how one feels, what makes a person happy or sad, is pronounced.

5.6.8 Workshop 8: Prototyping, testing and evaluation

This is the phase where the action plan is monitored; and eventual changes are performed. In this co-design project, it was the last and closing workshop. We had carried out an early version of prototyping when we facilitated for a sound activity in the third workshop. Using a web solution, the sound activity was set up, first choosing a feeling, then a sound, uploading it, and subsequently editing and sharing. We let the participants explore the prototype in pairs on their own. After that, we let them anonymously answer some questions on paper. The following are some of the answers from our co-designers to the question whether they saw any link back to where we started with science, identity, belonging and ethnicity:

It has something to do with feelings, and that makes it perfect for the museum

I think that the terms ‘belonging’, ‘science’ and ‘identity’ hits well in the APP. I do not understand how it can connect to ethnicity

It fits better with identity, belonging and ethnicity, unsure about science with the pictures as starting point.⁸⁵

⁸⁵The answers to the survey were given anonymously

5.7 Discussion

In the case of this current co-design project, the participants had a more fragmented relationship among themselves. They engaged with the museum in a mixed social context, comprising ages from sixteen to nineteen and with all the implications this has for group dynamics and engagement. When focusing on social interactions, with the themes and objects close but not in focus, participation and engagement for young people can be viewed as an exercise of democracy ⁸⁶. Furthermore, the material shows that the young participants essentially enjoyed and engaged during the processes. When facilitating for actions, interactions and dialogues during a participatory workshop, it can be difficult to manage engagement that is a little ‘out of control’, in the sense that it generates little response in terms of silence and noise. On the other hand, some of our co-designers experienced that they had a stronger impact during the first explorative workshops, which were vaguer in terms of deliverables. When it came to finalize the design of the sound installation, the feedback was that the last workshops had a greater influence. To stay in an explorative modus too long, can be problematic from a museum perspective to stay in because of the expectation of being able to deliver a product or concept in time on time. To conduct co-design processes is about letting go of control and simultaneously keep a direction. This may be an engaging entry to a participatory process, which provides opportunities for several ways of interacting with the objects and themes as well as with each other. How this meeting with objects and themes is connected to one’s own life has been illustrated by the young man expressing thoughts about his grandmother while looking at an old photo from early 1930s⁸⁷. At the same time, to take part in a co-design project that goes beyond the time-frames usual for a museum program, gives a potential to engage with museum objects and themes on a deeper level.

One challenge we had was that participants were attending the workshops on an irregular basis, which, though understandable, required a certain amount of pliability ⁸⁸. One key competence when planning and conducting co-design workshops, is flexibility:

⁸⁶ (Wals, 2019)

⁸⁷ (Black, 2012b; DeWitt et al., 2019b; Mygind et al., 2015b)

⁸⁸ (Sandholdt and Achiam, 2018b; Smith and Iversen, 2014b)

being able to alter both the content in the collaborative task as well as the timeframes⁸⁹. The ability to change is essential. This may influence the personal engagement of the participants both in positive and negative ways, as described in previous sections. It can be experienced as directionless and loose, in that we didn't know where it all would lead, as one of the participants expressed, such as when we lost some participants when the fall started, and the group had to be put together again with new participants. In the same way as visiting a museum, participating in a co-design process may at some points be experienced as chaotic. In our case, changes in group compositions not only contributed to fuzziness, but conceivably also to the fact that we lost some participants along the way, the ones who did not move from high school to universities, but still did not show up. The participants who had not been part of the experimental phase, had to jump into the project and those who had been part of it since the beginning, had to accept the group changes. Looking at the films from the workshops shows that to incorporate a newcomer in the process takes a lot of time and space. Consequently, the engagement of the young people slips a little, and they do not express themselves as much as one would expect, despite having been part of the co-design project for nearly eight months and now being the experts on the digital activity we were about to create.

In the SIB project we could rest on the fact of us being four museum professionals and researchers, with a varied field of expertise, which was something we took advantage of by changing roles during the workshops, and by distributing tasks and taking turns having the leader role. What we did not do, however, was to let the participants lead part of the workshops, letting go of the museum authority completely⁹⁰. Although such an activity could hold potential for a stronger ownership, none of the research material suggests that the youth felt exploited or that we were harvesting their thoughts to make the best digital installation. However, if they were not given the opportunity to earn some money, the picture might have been different. Our project did compete with the youth's other paid engagements such as homework assistance or part time positions in grocery stores. Remuneration may also contribute to equalizing the engagement between experts and non-experts. Given that the museum group did this work on paid hours, it was fair and reasonable that our collaborative partners were at least given a fee. Some of the experiences were remembered by the participants as engaging even though

⁸⁹ (Rock et al., 2018b)

⁹⁰ (Achiam, 2019; Modest, 2013a; Stuedahl and Skåtun, 2018a)

they were originally received with a lukewarm interest. Especially the making of sounds in an early phase was remembered as an engaging experience, possibly because it was a task that manifested in a jointly produced outcome. Nevertheless, the process underlined the shift from recipient to participant, where the participants can be the authoritative voice of their own experience⁹¹. In retrospect one could understand the design process as dialogic in the interplay between doing and reflecting, or as Brandt (2012) would say it; tell-make-enact. As one partner expressed it ‘I got a headache (because of questions), but I learnt to reflect more’. To find oneself in a situation that they are just silently waiting for participants to take the initiative, is not easy. However, allowing that situations may become chaotic and messy as described when collaborating on making soundscapes is also difficult. It is important to accept that not all interventions and actions work out as planned.

I think there has been a lot of fun in this process. Did feel that a lot happened between the workshops and sometimes I wished I could contribute (because it is fun) or receive some updates along the way (Catharina, 18 years).

As shown in this quote, our process was perceived as open and closed at the same time. Open in the sense that facilitating active engagement over a longer period of time means opening up for a deeper understanding of what museums are and can be. The co-design process was experienced as closed in that we made plans to go forward without consulting the young people. As professionals, though with some differences in how we understand a museum in society, we still have a common language or jargon. The session at the *Typical!* exhibition was meant to contribute to a common understanding of museum exhibitions and installations. I am not sure whether we managed to practice a common language, but rather share insights in likes and dislikes when making a museum exhibit. In such processes it is important to be aware of the power relations that often materialize in language. The youths had their language among themselves; as one participant once commented, this way of talking is typical when you come from our part of town and have a family background like ours. Thus, as far as language and vocabulary goes, there were several levels: among the youth, between museum professionals and youths, and between professionals.

⁹¹ (Humphrey and Gutwill, 2017)

Our project was in some ways very ambitious, we strove to be open-ended and to have our young participants and their engagement as a point of departure when planning next steps and methods. This sometimes resulted in the participatory exercises being too tight and too many, as well as the opposite. Our participants noticed that we at some points really did not know which way to go forward. This contrasts with other learning activities which are planned in detail and often have clear aims. This is a role that is recognizable from everyday school life as well as when visiting museums with your class. Consequently, it was a challenge that made it easy for the youths to fall into a pupil role, waiting for new approaches and initiatives. Participatory projects can be translated into a constant awareness of what the benefit for the participants is ⁹². We stressed the fact that the project will be a learning or activity program, which maybe did not really need to be stressed at this point. In retrospect, we know that it became something completely different in the end. Stressing the educational bit of the program limited the development of the activity in the way that it connected learning to museums and schools.

5.8 Concluding thoughts

To take something known and move it into a new and unknown setting, brings new possibilities of becoming an interesting tool as it happened with using sounds from everyday life and re-using them to make stories. Our young co-designers wanted to work with pictures and could not see the engagement in sound. Therefore, it is important to have enough time to experiment so that engagement is shared among all co-designers. As in many cases communicating science at a science museum is complicated: it is time and place specific and a scientific “truth” changes character while traveling from one context to the next. Co-design has possibilities of engaging with this understanding of the relation of context and the understanding of science, to open up for the more complex questions of science. In this way museums become institutions of democracy. Elements of this process, such as facilitating a creative process making something together, can be implemented as a museum program inviting communities, children and young people, and can be part of a pedagogical offer of a science museum which lasts for more than the usual 45 minutes of school classes, and have other aims and outcomes. To have long-term collaborative engagements with museum users encompasses and reinforce a connection between museum and society. It

⁹² (Lynch, 2017)

provides an opportunity to listen closely to what society needs as well as to enable citizenship on a group and individual level. Co-design approaches, and the method of FW seemed to offer a feasible framework to this aim and is relatively easy to translate into museum collaborative endeavors. FW provided structure by dividing the various work sessions into phases that became manageable and gave a way forward for the museum professionals and the young participants. It sustained engagement at the face of much change and unpredictability, and therefore may be a useful tool for developing long-term partnerships.

6. Science, Identity and Belonging: Knowledge development through co-design actions and dialogue

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with co-design partners Shukran Kaakal and Stephen Ravi

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6.1 Abstract

Science, identity and belonging (SIB) 2016-2018, was a collaborative exhibition design project between a youth group aged 16-19 years, and a cross-disciplinary museum team. This paper is based on a discussion with our co-designers Shukran Kaakal and Stephen Ravi who we collaborated with in two phases. In the first phase, we co-designed the digital sound installation *The Sound of FOLK* connected to the exhibition *FOLK – From racial types to DNA sequences (FOLK)* at the Norwegian museum of science and technology (NTM). This paper will mainly focus on the second phase, exploring the pathways of knowledge as an outcome of participatory processes. This is the phase where Shukran and Stephen were invited to take a leading role in developing an educational program by planning and facilitating a collaborative workshop addressing socio-scientific issues with younger children, aged 10-13 years.

Key words: teach science, co-facilitators, co-design, learning, role change, controversy

6.2 Introduction

In the field of science communication and learning, there is a distinction between ‘learning science, learning about science, doing science and addressing socio-scientific issues’ (Hodson, 2014). A science museum can offer all these ways of learning science. However, the science activities conducted in the exhibition *FOLK from racial types to DNA sequences*⁹³ (2016-2019) (FOLK) which is the focus of this paper, falls into the

⁹³ The FOLK exhibition was an outcome of the research project 'Race' and 'ethnicity' and the science of human genetic variation 1945-2012 with an overall aim to investigate the interactions between societal and scientific processes in the establishment of concepts of 'race' and 'ethnicity' in physical anthropology and human population genetics. <https://www.tekniskmuseum.no/folk/research/about-the-project> date accessed 11.12 2021

last category of addressing socio-scientific issues. Building a capacity to make informed decisions is also a kind of scientific literacy, as is positioning oneself ethically and increasing tolerance, empathy, respect and social justice (Hodson, 2014; Pedretti and Iannini, 2020; Wals, 2019). As science museums moves between science and society, they hold a possibility to raise questions and encourage dialogue on issues of science and sustainability (Bunning et al., 2015; Evans and Achiam, 2021). By extension, the development of understanding and knowledge is closely linked to who we are, how we perceive ourselves in the light of the environment, and how we are shaped through dialogue and interaction (Dysthe et al., 2013; Falk and Dierking, 2000; Hein, 2002; Hooper-Greenhill, 1999).

To focus the conversation on controversial issues is not new as a pedagogical approach, if we understand controversial issues as matters that are complex and that create disturbances through uncertainties and vagueness (Dillon, 2017; Pedretti and Iannini, 2020). Furthermore, knowledge creation around these subjects are shaped by conversation and collaborative interactions, and in this case is included in the planning of practical activities and the guidance required while performing (Riikonen et al., 2018; Skydsgaard et al., 2016). Additionally, other studies of controversial issues in science museums show that participatory practices give opportunities to illuminate uncertainties, question authority and unpack controversies within science communication (Eikeland, 2020; Sandholdt, 2018). In view of these inquiries, we asked ourselves if co-design may work as a pedagogical tool to stimulate reflections to complex problems that are hard to articulate. As the co-design process includes creation of design plans, prototyping, evaluation and investigation of the design process as a learning process. In this paper, we will investigate how knowledge about controversial issues holds a potential to be dynamically created through sustained collaborations between young people and museum professionals. More specifically, we investigate how giving more attention to facilitate dialogues and collaborative interactions on socio-scientific issues will enhance learning within the museum space. We discuss the following three questions: a) how can science museums support young people in dialogues of controversial issues? b) how can the museum use co-design activities to make these dialogues happen? c) what knowledge and insights young people acquire in this process, which in turn will be relevant for understanding ongoing discussions in society? The pivot point for our analysis is the FOLK exhibition at the Norwegian

Museum of Science and Technology (NTM), which asked visitors to reflect on how scientific racial categories has influenced today's understandings of human diversity and discuss the impacts of this science on society.

6.3 Background: Science museums and co-design

As is the case in many museums and science centres, NTM does not have a long tradition of co-design with the end-users throughout the development phase of exhibitions, activities and learning programs. However, the NTM has collaborated in different ways with teachers, pupils and institutions in the process of creating programs and exhibitions. The collaborative endeavours often concentrated on testing ideas and concepts, although, in our experience, with a low awareness of issues that the field of co-design raises, such as power, relevance, language, control and degrees of participation (Holmegaard, 2020; Mygind et al., 2015). Co-design aims at placing the learner at the beginning and centre of development (Simonsen and Robertson, 2012; Taxén, 2004). Co-design processes may question the shifting roles and the authoritative voice, but are at the same time in danger of reinforcing existing structural differences (cf. Björgvinsson and Keshavarz, 2020; Lynch, 2011; Sandholdt and Achiam, 2018). In our case, exploring co-design as a method for raising controversial issues in the science museum aims to let the children or young partners be the protagonists of the process and outcome of the design (Iversen et al., 2017a). We have a special attention to making the collaborative endeavour empowering in the sense of building capacity to make better choices and judgements in life (Modest, 2013; Stuedahl and Skåtun, 2018; Tzibazi, 2013).

Equally, it is important to take into consideration when applying co-design as a participatory method is that science is not neutral, but interwoven with societal values, with a complex interrelationship for the public to engage with and on. Co-design in science learning is said to have a potential to be dialectic and open to negotiations of science understanding and to bridge onto everyday life (Tzibazi, 2013; Sandholdt and Achiam, 2018). For museums to act on societal issues relates to the way these institutions reflect existing power structures, which provides an opportunity to be agents for social change (Sandell and Nightingale, 2012). Within the field of participatory

design, learning processes and the mutual learning between designers and partners are essential (Bjerknes and Bratteteig, 1995; Simonsen and Robertson, 2012). The attention is on dialogues and the sharing of meanings as the driving force in the process of creating a future and yet, unknown outcome (Smith and Iversen, 2014c). Co-design has been conducted to support negotiation of meaning across life experiences, work and education, and has been closely connected to the development of knowledge (cf. Eikeland 2020; Brandt et al., 2012; Bratteteig et al., 2013; Stuedahl, 2004). The role of the partners in the negotiation is established in the intersections between the collective doing, adapting, making and creating (Sanders and Stappers, 2008). While being a design process, it is not always the outcome, ie a design product, that is in focus, it is equally important to focus on the process, the values, knowledge and understandings that comes out of it (cf. Bardzell et al., 2015; Ciolfi et al., 2016; Lloyd and McDonnell, 2009). In a science museum, the world of science is in constant change is relevant for this knowledge process. Participatory practices may serve as an instrument to keep the museum at pace with the development and enable a discussion on scientific controversies (Yaneva et al., 2009).

6.4 The co-design in Science Identity and Belonging (SIB)

The research program, Science Identity and Belonging⁹⁴ (SIB) complemented and was connected to the FOLK exhibition and comprised of two phases. In phase one, in tandem with the exhibition creation, we arranged for eight workshops that involved co-designing the interactive multimedia installation *Sound of FOLK*.⁹⁵ We collaborated with a youth and a cross-disciplinary team for two years. The lead author (hereafter Torhild) holds a dual role as museum pedagogue at NTM as well as researcher and has within the SIB research program developed several co-design interventions as well as the learning program for FOLK together with a museum team⁹⁶ and the external museum researcher (hereafter Dagny). This paper will discuss phase two of the SIB

⁹⁴ This paper is one of three academic papers and an outcome of the research program Science, identity and belonging (SIB) 2016-2020. <https://www.tekniskmuseum.no/science-identity-and-belonging>, date accessed 08.12.2021

⁹⁵ We arranged for eight workshops with a group of eleven young people from Grorud Youth Council. Stephen was a member and Shukran his friend.

⁹⁶ Additionally, the museum team in phase one consisted of history of science curator Ageliki Lefkaditou and technician and master student in informatics Tobias Messenbrink.

project that took place during the winter of 2018-2019. It elaborates on the longitudinal collaboration with two young people, Shukran Kaakal and Stephen Ravi ⁹⁷(hereafter Shukran and Stephen) who were recruited to the project as members of Grorud youth council⁹⁸ and as our partners in co-designing the sound installation in the first phase of the project. In phase 2, we collaborated in planning, designing, facilitating, and reflecting on a workshop with children of age 10 to 13, Shukran and Stephen were our active research partners in this work, which involved two planning meetings and one debriefing meeting reflecting on the process with the four of us. All the activities took place at the NTM, and we arranged for meetings and workshops at the museum, in the LAB⁹⁹ and within the spaces of the exhibition FOLK. Our planning, conducting, and reflecting has this singular workshop, arranged at a Saturday afternoon, as a pivot point. The workshop lasted for four hours and involved four children.



Figure 1: FOLK from race types to DNA sequences, a measuring instrument in a glass case in front of a wall with pictures of military recruits 1920-21. Photo: Åsa Maria Mikkelsen (2018), printed with permission.

This co-written article extends the collaboration, involving Shukran and Stephen as co-authors after the project, with Torhild leading the writing process and responsible for

⁹⁷ Shukran Kaakal and Stephen Ravi are their real names, according to their wishes.

⁹⁸ Grorud Youth Council, our collaborative partners were members of the youth advisory board of the Grorud borough in Oslo, the capital of Norway. The council consisted of 11 young members, 4 – 9, of whom participated in SIB activities.

⁹⁹ LAB is a research and mediation laboratory within the NTM, established in 2014 to explore how research and knowledge making can be understood at the museum.

keeping a direction for the train of thoughts. In addition to the close collaboration on arranging and evaluating the workshop, Shukran and Stephen gave feedback on an early draft of this paper. Among other things, they have specifically asked for an elaboration of an activity that they suggested, and we arranged for during the workshop.

6.5 Theoretical framing: Science museums and controversial issues

Museums have traditionally been, and still are, knowledge-producing institutions through their collections, exhibitions and programs. In this context, science museums have always had a focus on visitors engaging with science as an approach to increase scientific understanding (Alberti, 2017; DeWitt et al., 2019; Evans and Achiam, 2021). Accordingly, museums are to be considered authoritative institutions that keep and produce society's historical record of what supposedly can be perceived as the truth (Henning et al., 2015). Today, science museums and science centre's face a growing challenge concerning which role they ought to have in the communication of science (Rock et al., 2018a). To empower the public to actively take part in socio-scientific issues and thereby in democracy, is not a new trail for science museums (Henriksen and Froyland, 2000). Furthermore, a science museum with its collections, exhibitions and programs may give attention to scientific controversies, on subjects that can be described as a wicked problem that do not have a clear solution (Davies and Horst, 2016a; Dillon, 2017; Pedretti and Iannini, 2020). Among other things, there has over the past years been a stronger attention on science museums' potential to take an active part in the building of science capital¹⁰⁰ among young people (Archer et al., 2015; Dawson, 2018b; DeWitt et al., 2019a). Furthermore, there has been an increased recognition that what constitutes scientific knowledge needs to be questioned, as not universal but relative to the institution and context of where it occurs (Achiam and Marandino, 2014). In many respects actions, dialogue and collaborations are still very important features when museums facilitate for development of knowledge within the space of learning programs (cf. Black, 2012; Galani et al., 2020; Hooper-Greenhill, 1992). Over the last years the maker movement has contributed to a stronger attention on a common process which centres around creating material artefacts (Dawson, 2018b; Moore et al., 2020).

¹⁰⁰ Science capital in informal sites for learning focus on what you know, how you think, what you do and who you know, which in turn shapes attitude towards STEM learning;
<https://learning.sciencemuseumgroup.org.uk/our-approach/>, accessed 17.01.2022

Similarly, dialogues on controversial issues can be nurtured and performance of scientific citizenship can be stimulated within these museum settings. Despite the fact that museums are working relationally with collaborative and participatory practices, it may be necessary for them to establish even stronger networks with the surrounding community. This allows the museum to expand the knowledge, share the risk of not always succeeding and improve the quality of its programs and exhibitions (Achiam and Marandino, 2014; Black, 2012a). Beyond teaching and experimenting with science, science museums have the potential to make visitors engage critically with controversial issues and act on societal questions relating to science (Pedretti and Iannini, 2020). A user involving approach may be helpful to address societal issues within a science museum, with an aim of designing for visitors' reflexivity in programs and exhibitions. Dialogue and common decision-making, which are central elements in a co-design process, may frame an unpacking of complex questions and bring forward new understandings (Eikeland and Frøyland, 2020).

6.6 Knowledge and participatory practice in the science museum

In collaborative design processes, all partners are considered to be active individuals searching for knowledge and understanding. How humans make meaning of the world is often related to all the various social contexts framing their experiences (cf. Black, 2012; Falk and Dierking, 2000; Hall, 1997; Louw et al., 2017). Furthermore, the encounters between partners can be recognized as a hybrid space where conversations about different positions flourish. Constructivist pedagogies take this as a point of departure and emphasizes that the production of knowledge is based on our individual meaning making, enhanced by the former experiences each individual carries into the learning situation (Hooper-Greenhill, 1992; Hein, 2002). As a result, we cannot see knowledge as a separate entity that exists outside the learner, and which can be poured into the learner (Hodson, 2014; Winstanley, 2018). As such, through the lens of a constructivist approach, museum knowledge building requires that the user brings a motivation as well as the skill to learn, and that the prior knowledge are known to the museum to a certain degree (Black, 2012a). In a prolonged co-design process, there are many openings to become better acquainted with each other's skills, discuss values and elaborate on understandings. Dialogue and reflexivity are the driving forces in this joint exploration, through movement, choices, control and negotiations (cf. Eikeland, 2020;

Holmegaard, 2020; Star and Griesemer, 1989; Stuedahl, 2004).

Furthermore, participatory practices in science learning have the potential to be dialectic and open to negotiations of science understanding and to bridge onto everyday life (Dindler et al., 2010; Sandholdt and Achiam 2018). Conceptions and ideas are utilized in processes of mutual learning in co-design: the understanding we bring to the situation is acknowledged, valued and shared (Archer et al., 2015;). In the field of science education, Hodson (2014) divides science learning into the formal (education) and informal (everyday) knowledge we possess in combination with our personal frameworks of understanding. Understanding and knowledge are therefore integrated parts of who we are and how we interpret ourselves in connection to our surroundings. Knowledge occurs when skills and understanding correlate, instead of relying on pure luck while performing tasks (Pritchard, 2018 p. 208). Knowledge can thus be understood as something closely related to being human and connected to the actions we perform in the space and time of specific contexts where we are (cf: Biesta, 2015; Nonaka et al., 2000; Pritchard, 2014). DeWitt et al. (2019) encourage the science museum to broaden its view on meaning-making and support an inclusive understanding of the various knowledges the visitors brings with them. The dialectic of participatory practices opens for this inclusive understanding of the formal and informal knowledge visitors bring to the museum.

6.7 Dialogues and learning in a social context

Participatory practices build on and strengthen the social nature of learning. In its essence, it brings people together and reinforces the social networks of learning through interaction, viewing the actions as cyclical in combining reflections and actions, (Rudman et al., 2018). Knowledge development can take place as a practical and shared activity, relying on creative processes through dialogues and actions, in a non-linear process focusing on a shared physical or abstract object (Riikonen et al., 2018). According to Lev Vygotsky, learning starts on a social level between humans before it becomes internalized and shapes an individual's understanding. For Vygotsky language and action is considered an important tool for mediating the learning process (Vygotsky in Postholm and Smith, 2017)). As such, knowledge can be tacit, unpronounced, and not always known to ourselves (Mason, 2015; Nonaka et al., 2000). Active encounters may

be a way to reinforce knowledge and understanding. Situations where there are connections between skills and knowledge provide security in further actions and mindset.

The scope of where development can take place is in the interplay between what a person can do alone and together with others, which implies that the collective actions in a given social community do develop and change (Engeström, 1999; Simon, 2010b). As the title of this paper suggests, *Knowledge development through co- design actions and dialogue* points to the workshops and planned meetings that have been defined as co-design interventions. However, some clarifying of the central concepts for the co-design intervention is necessary. Collaborative design builds on human interaction through conversations and actions, and it is in essence a social process that brings together competencies and insight across disciplines (Bratteteig et al., 2012; Vavoula and Mason, 2017). The main aim of the co-design effort described in this article was to enable our partners to be able to run and lead the workshop, to be the driving forces in the actions and dialogues, and to give them the floor to apply their learning from phase 1 to interact with children in phase 2. As the Brazilian philosopher of critical pedagogy Paulo Freire emphasizes, reflexive practice and dialogue are essential, as there is a close connection between language, dialogue and political structures. The dialogue may be viewed as a tool to build capacity to act in society (Freire and Freedom, 1998; Xavier et al., 2021). Moreover, in co-design interventions dialogue can be understood as dialectic interactions between tacit (personal) and explicit (systematic) knowledge amongst individuals, the collective and the context. Dialogue requires articulation of tacit knowledge to explicit knowledge, stating opinions and experiences, asking questions, and listening. Dialogue is polyphony caused by its cultural, linguistic and social nature; it surfaces through negotiations and interactions between humans. Knowledge develops through tensions and resistance in dialogue (Bakhtin in Dysthe et al., 2013 and Galani et al., 2020). This understanding of dialogue resonates with a co-design process that in essence is dialectic and rests on principle of equality and mutual learning, viewing all as experts of their own life and tension as a requirement of development (Ehn, 2017; Simonsen and Robertson, 2012; Tzibazi, 2013).

6.8 Analysis Science, Identity and Belonging: arranging the workshop with four children

We wondered if participation in processes that are co-design within the framework of a science museum would contribute to building a capacity to interpret the public discussion related to societal and scientific issues. Co-authors Shukran and Stephen had participated in the eight workshops in phase 1 that resulted in the Sound of FOLK in 2018. During the summer of 2018 they had been working as assistant museum explainers alongside other Sound of FOLK co-designers from Grorud Youth Council. The job was followed by an engagement as explainers in a science workshop that travelled around libraries in Oslo during the winter 2018/19. Throughout the process, the SIB research project had a desire and aim at empowering all participants through interesting and challenging tasks, including undertaking paid work at the museum. Building on Shukran and Stephen's experience with the co-design of the Sound of FOLK, we invited them to plan with us and then lead a further co-design experience with younger children, focussing on how to facilitate dialogues around the controversial issues discussed in the exhibition FOLK. Together we planned a four-hour co-design workshop which took place on a Saturday in March 2019, that had the design of a museum activity as a mission.

The collaborative group entered the project with different knowledge, spanning from senior museum researcher Dagny and pedagogue Torhild to Shukran and Stephen who brought with them design experience and a budding insight to what a museum activity could accommodate. Moreover, we brought a joint experience from phase one: Additionally, and as time had passed, there was also a ripening of understandings. This became a process where we approximated and acquired understanding and insights such as interests, interpretation and perception of a science museum and its activities. Several knowledge pieces became common property between us, for example how to understand learning within a museum as well as how to plan and manage an open-ended workshop. Keeping in mind that creating a safe spaces for interaction takes time, particularly when the participants are unknown to each other, a point which we will return to (cf. Katrikh, 2018; Morse, 2020; Stuedahl et al., 2021).

<i>Meeting 1: 18th of December 2018:</i>	<i>Organizing and recruiting</i>
Planning how to organize and recruit from Ground Youth Club and discussing the designations, science, identity and belonging.	
<i>Meeting 2: 21th of February 2019:</i>	<i>Anchoring and implementation</i>
Details on facilitation, who are to welcome participants and how. As we fail on recruiting from Gorud, how to go about gathering a group of children. Make a list of equipment, food to buy and when to meet.	
<i>Workshop: 16th March 2019</i>	<i>Co-designing and exploration</i>
Prepare and run the workshop in the exhibition and in LAB, equipped with colored dots, pen, paper and writing books.	
<i>Meeting 3: 23rd March 2019:</i>	<i>Analyzing and reflecting</i>
A reflective conversation in the museum LAB, guided by Shukran and Stephen with the program and micro-blogs as structuring dialogue.	

Figure 2. Overview of points of meetings in the SIB project phase 2, Ill: Torhild Skåtun

6.8.1 Meeting 1: organizing and recruiting

The first planning meeting took place on the 18th of December 2018 and was focused on organising the workshop and recruiting participants. We created an outline of a research design that had an attention on the collaborative processes with younger children for two reasons. First, to benefit from using the authority that age could provide for our co-facilitators, and secondly to activate the expertise of being a young person with a cross cultural background as our co-facilitators hold. Furthermore, the children as well as Shukran and Stephen brought with them skills as students in compulsory education (Stuedahl and Skåtun, 2018), shown in this quote by Stephen:

"...even in high school, the teachers try to vary, more than just lectures and talking for an hour and a half, you try to have other, for example ... yes, group

work for example, specialization course, presentations" (Stephen 18. December 2018).

Our common experience of co-designing the digital installation *The Sound of FOLK* became a point of departure for our planning. The fact that the co-design workshops at the beginning of SIB happened with significant time gaps, was something that both Shukran and Stephen commented on: They emphasized that a lot happens in a young person's life, and that it takes time to recollect what happened during the previous session. They were therefore keen to contain the co-design experience temporally.

Moreover, Shukran and Stephen were rather reluctant towards the usage of the term 'identity', arguing that it would be a difficult term for a younger child to understand:

"They (children) connect words like identity with completely different things than what we do". (Shukran 18 years, 18. December 2018)

This led us to expand the conceptual apparatus for the workshop, adding the word *sorting*, as the word could help us to sensitize the younger participants to the topic of historical race science. Also, sorting was perceived to connect better to the experience of diversity in today's society as a matter of concern illuminated in the consideration of upbringing and background. Furthermore, we hoped that our cooperation would give time and space to discuss the essence of the exhibition topic, trying to deal with the impact of race science from the time of enlightenment and onwards (Hodson, 2014; Sandell, 2016; Smith and Iversen, 2014c). We set up a plan to recruit a group of children from a youth leisure club during the winter holiday organized by Grorud borough.

6.8.2 Meeting 2: anchoring and implementation

The second planning meeting took place on the 21st of February 2019. Despite our recruitment of child co-designers, no-one had signed up for our activity, and Dagny and

Torhild had to recruit children actively using networks at work. We succeeded recruiting four children by contacting their parents. Knowing the age and gender of the participants we used this meeting to decide on activities and sessions for the workshop. We agreed on a combination of group work activities and plenary sessions, outlining activities which suited our theme and discussing how to use scenarios-building. In this phase we added microblog writing to materialize conversation and enact reflection for all the co-designers to consider in-between each activity, where the intention was to provide more channels for conversation, also in writing (Amundrud et al., 2021). As we had agreed that not everyone liked to talk in groups in unfamiliar settings and with strangers.

We continued to discuss the concept of the learning activity, Dagny called for an overarching thematic problem to solve, and the word *prevent* surfaced as a term that captured the aim of the whole program we were about to co-design. Correspondingly, the outcome of our co-design of a learning program would be an activity where dialogue and reflection were in focus, conversations that in the next round could work preventively to handle issues around belonging and identity. We were about to orchestrate a co-design endeavour revolving around the societal issues of human biological differences. At both preparation meetings with Stephen and Shukran we paid a lot of attention to clarifying expectation of our different roles with a focus on ensuring that they felt secure as workshop facilitators. We emphasized that it is a demanding exercise in the span between having control and being flexible and open to making changes along the way (cf: Akama and Light, 2018; Simonsen and Robertson, 2012; Smith and Iversen, 2014).

Workshop: co-designing and exploration



Figure 3: Researchers, children and facilitators are working together exploring the concepts of sorting, identity, ethnicity and belonging. Herman Walby (2019) printed with permission.

The workshop was held on Saturday 16 March from 1 pm to 5 pm, with one boy of thirteen, two girls of ten and one girl of twelve. While the children took part in the workshop, the parents stayed close by in the museum. This gave us the opportunity to invite them later in the workshop, which was not part of the original plan. Overall, the workshop went as planned, with some adjustments. We started in the exhibition FOLK with the four children. Stephen and Shukran started by presenting the day's program, explaining where we would be working, what we would have to do and when we would have breaks.

Shukran and Stephen added a new “get to know each other” game, a way of presenting ourselves. Stephen was familiar with the game and thought suitable for our workshop. We all had to start by giving our name, age and which school we went to, and then tell the colour of our toothbrush. The proposal of the entry into the workshop showed that Shukran and Stephen were also planning in our absence, with an aim to help the children to be more comfortable. As Stephan argued during our meeting, analyzing and

reflecting the game also challenged us all to get out of the comfort zone.

Subsequently, the floor was given to Torhild for an elaboration of the research program and aim of the workshop: to develop a learning activity together. This was followed by the “forehead-dot” game, as suggested by Shukran. He knew the game from a school visit to the Nobel Peace Center some years earlier. The game involved each participant getting a coloured dot on their forehead and then having to find out what colour dot they had without talking. The game aimed at highlighting being singled out as not being part of a group. However, as Shukran pointed out in meeting 2, the person who received the different dot didn’t know any of the others, which weakened the point of the game. Shukran and Stephen then led a conversation about exclusion and how this can be experienced at school.

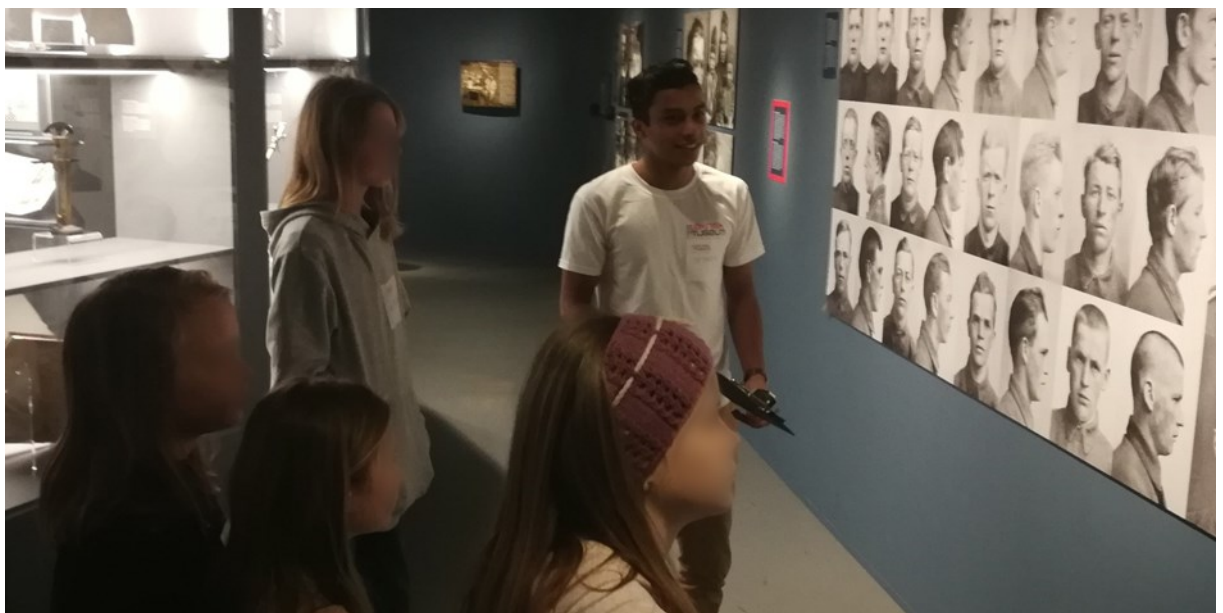


Figure 4: The group in front of the recruit photos from 1921 in the FOLK, on a tour in the exhibition given by Shukran and Stephen. Herman Walby (2019) printed with permission

After the game, there was an introduction to the next task, which was to brainstorm associations around the keywords ‘identity, sorting, ethnicity and belonging’. The term ‘sorting’¹⁰¹ was explained and connected to the previous task of grouping us according

¹⁰¹ Sorting is almost the same word in Norwegian, *sortering*.

to the colour of the dot on our foreheads. Stephen and Shukran continued clarifying ‘identity’ as something that binds us together such as going to the same school, ‘ethnicity’ as our background and so on, using themselves as examples: one being from India and the other from Pakistan. ‘Belonging’ was explained as the group you connect to and also having similarities with the colour-dot-game and the term ‘sorting’. The children were divided into two groups with Shukran and Dagny leading one and Stephen and Torhild the other. The work was slow, this can be seen in the transcripts, where one participant starts writing a word, led by a long pause before the next word is written, facilitators and researchers having to drive the dialogue forward. After a while the conversations got deeper and involved both groups leading to all eight in the room taking part. The groups concluded that the three categories except ethnicity have much in common, and that the keywords fit every term. However, ethnicity may influence the other categories. Quite the same as how the understanding of ‘ethnicity’ unfolded in phase 1, as a term that was more complicated to distinguish from the other terms and that somehow fitted everywhere.

The introduction phase, which sensitizing the participants to the concept of the workshop, was followed by a tour of the exhibition, prepared and given by Shukran and Stephen. Their focus was on the wall of soldiers’ photos from 1920–21, see figure 3 above. This was an activity that resembled the interaction with objects they had underwent during the initial phase 1 workshops: For example, when the curator explained about the measuring instruments. The tour was a suggestion from Stephen and Shukran who chose to focus on the parts of the exhibition they felt most confident in. The children then spent 20 minutes exploring the FOLK-exhibition together with Dagny, Shukran and Stephen. After that, we moved to the museum’s LAB area where the children worked in two groups, Dagny and Torhild formed one, to develop scenarios for learning activities related to the FOLK exhibition. The session lasted for 35 minutes and resulted in three scenarios of a museum visit, which were subsequently presented to the whole group including parents.



Figure 5: In pairs the participants create scenes of a learning program connected to the FOLK exhibition, copyright (2019) Herman Walby, printed with permission.

6.8.3 Meeting 3: Analyzing and reflecting

A final meeting took place on the 23rd of March 2019. The conversation and thoughts flowed quickly and freely in this meeting where we had our shared experience of the co-design workshop as the pivot point, enabling us all to externalize opinions in a joint attempt to analyze the conversations and actions. We reflected on how the workshop activities could be improved, such as how providing pre-written words for participants to associate with terms like ‘sorting’ and ‘identity’ would frame a mindset and prompt the conversation. Moreover, at the start-up of the workshop we had to make changes due to the fact that there were fewer participants than we wished for, which also influenced the whole workshop as expressed by Shukran:

"I still think that something that was a little problematic with the workshop was that we had few children. To make the workshop more legit, we should have had at least 10 kids" (Shukran 18 years, 23. March 2019)

We discussed the microblogs, in a microblog written by Stephen one of the participants

expressed the activity will be better if they knew each other. The children divided themselves into two groups, the two who knew each other collaborated creating a design of a museum activity together, those who didn't know one another spent time getting started. We conferred about this as not entirely fortunate:

" I think the activity will be better with people that know each other. That was somehow what we said, it was to the point on how someone can be isolated, just because of their interests, colour of skin or clothes". (Stephen, 19 years, 23. March 2019)

The above quote, discussing a text from the microblog, shows two insights: first, it shows that when working in a participatory way, it may be easier to start the process if participants know each other. As it was, the two groups were somehow on uneven footing, which is why we later reflected that we should have put pairs together that didn't know each other to create more evenness. Here we are told the necessity of time to get to know each other, and that when it is only one-of as a co-design pursuit, there will be limitations of outcome for the participants as well as the museum. In difference to phase 1, the making of Sound of FOLK, we were after this workshop left with an idea for a museum activity. Possibly, a longer timespan would result in more concrete design results.

6.9 Discussion

Understanding Shukran and Stephen's knowledge process as co-designers is dependent on having an awareness of the longitudinal process of participation that they were involved in during the first phase of co-design of the Sound of FOLK. Our aim was to understand what knowledge participants in co-design processes gain from engaging in a sustained collaboration, and to enable Shukran and Stephen to be facilitators for developing new programs for children and to give them the opportunity to be supported to develop knowledge and skills (Iversen et al., 2017).

In the case we discuss here, the museum was the framework and the FOLK exhibition the arena within which we explored how to co-design a sketch of a learning program.

The paper sought to answer following questions; a) how can science museums support young people in dialogues of controversial issues? b) how can the museum use co-design activities to make these dialogues happen? c) what sort of knowledge and insights young people acquire in this process, which in turn will be relevant for understanding ongoing discussions in society?

The prolonged collaborative production of experience and knowledge in SIB strengthened the search for new questions, questions that we do not yet know how to articulate (Estalella and Sánchez-Criado, 2015), and in this way it strengthened the participants' dialogic skills in dialogues on controversies about ethnicity. The role change deepened the dialogue and common decision making. This providing the opportunity to enquire how knowledge and insights developed, and how Shukran and Stephen brought with them experiences from the first co-design sessions to the second, planning, arranging, and evaluating the co-design workshop with children all related to the same topic.

In the co-design activities that made these dialogues happen, the workshop was central. The dialogic learning became clear in the empirical material from the preparatory conversations with Shukran and Stephen, paying special attention to mutual learning with the workshop as common experience and point of orientation. The workshop became a space where knowledge prospers across the performed skills and behaviour of youth, children and museum professionals, where communication of diverse understandings is essential (cf. Hodson, 2014; Louw et al., 2017; Simonsen and Robertson, 2012). Moreover, our partners entered the project with several more insights and competencies, relevant experiences related to the term 'race' not being neutral and the way one is composed of diversity with a family background from India and Pakistan.

During the start-up of the workshop, our partners drew on experiences from previous learning situations, and initiated two "get-to-know" activities with the aim of becoming better acquainted and thereby strengthening interaction during the workshop. Our co-facilitators chose to start the workshop with the children by presenting the exhibition.

Shukran and Stephen were both a little doubtful whether the children would understand the topic ‘identity’ and Stephen used the wall of military recruit-pictures, see figure 3 above, as a starting-point for a controlled dialogue with the museum artefact as knowledge pieces.

The activity of making scenarios of a museum visit worked very well in their view, but probably worked best in the group with two friends. When evaluating the process, none of us were satisfied with the association task around the keyword’s ‘identity’, ‘ethnicity’, ‘sorting’ and ‘belonging’. Stephen and Shukran had expressed their doubts that young children may not capture the full meaning of these complex terms, and they were right. Nevertheless, insight were gained on how to teach science surfaces, as well as the complexity of entering topics of societal issues through common reflections on actions (Ash, 2019b; Hodson, 2014). Though there emerged some valuable reflections, we concluded that we should probably have provided pre-organized sets of words that the children could move around and discuss as an activity of awareness.

During the project of phase 2, Shukran and Stephen became more and more active research partners in the interpretation of the workshop, indicating what sort of knowledge and insights they gained by participating in the project. Based on the recordings and transcriptions of the meetings before the workshop, Dagny and Torhild were the ones that mainly spoke. Many pauses and silence were included giving space for everyone to talk, but essentially, they were the ones driving the dialogue forward. This changed in the debriefing meeting when we talked through how the workshop had worked. We had made no specific plan of how to manage conversations through the sessions, which enabled Shukran and Stephen to suggest that the plan of the day should be to evaluate the workshop process and the activities in the way they progressed. The microblogs written by the children were read aloud where they fitted in the program. The four of us had a shared experience, and together we knew that it was a challenge to get everybody to talk. Moreover, as Shukran also pointed out, a Saturday is a free day for children, and it is a day to do nice things. He thought visiting the science museum and participating in our activities reminded him of school (Bennett, 2013; Black, 2012; Hooper-Greenhill, 1999)

Shukran and Stephen expressed reflections on what a learning dialogue activity is and how to implement it within the spaces of the museum exhibition. This helped to understand how the interactions between us as professionals, the children and our youth facilitating partners unfolds. It builds a clear parallel to how professionals interact at the museum, with a shared core of tasks that is understood and interpreted a little differently from person to person. Especially valuable was the description, analysis, and evaluation of the workshop with children during our last meeting with Shukran and Stephen. Together we became reflective practitioners, reflecting on actions and dialogues, with an aim to improve further practice (Rudman et al., 2018; Ash, 2019; Schön, 1987).

We also have to keep in mind that when people are entering a science museum they usually arrive with an expectation of learning, and in many ways the museum behaves like a teacher, in its exhibitions, learning programs and facilitated activities (Bennett, 2013b). To establish collaborative partnership across these traditional roles and borders is challenged by this expectation. As museum pedagogue no longer behave as the teacher, but focuses on giving space to unpack and challenge communication of complex questions without clear yes or no answers (Dillon, 2017; Eikeland and Frøyland, 2020; Yaneva et al., 2009b), there is still a need to be aware that the co-design endeavour can orchestrate a dynamic exchange of knowledge through actions and dialogues between the children participating in the workshop. As Shukran pointed out, it can be quite tiresome listening to lectures and following museum tours. Also, a variation of type activities may give room for a diversity of individual interpretations. His arguments coincide with previously outlined theories on development of knowledge related to socio-scientific issues (Eikeland, 2020; Frøyland, 2003; Hodson, 2014) which argue for ways of using the museum as a space for self-directed learning experience, and sometimes participating in the planned formal activities.

6.10 Concluding thoughts

In this paper we discuss a co-design project, where we strived to share responsibilities, control, and the power to decide with our partners to answer the research question.

Using co-design as a method to facilitate young visitors' dialogic skill in controversial scientific issues requires the museum to transform the authority that we as project leaders hold (Ash, 2019; Lynch, 2017; Rudman et al., 2018). Looking at a co-design as a framework for elaborating on how knowledge develops, responds in many ways to how dynamic knowledge is developed within a given relationship that crosses age and experience and we can follow some of its pathways as the co-designers are building capacity, understanding and adjusting their questions over time. At the same time, this co-design process has certain limitations to how much it can help us understand knowledge production. There are few people involved, and the considerations around the singular workshop experience was not taken further in facilitating a new workshop. Arranging a second workshop with children based on the findings from the evaluation of the first would have given us an even deeper understanding of the knowledge development of Shukran and Stephen as facilitators. A tentative of how pedagogic at a museum work takes shape, tacit knowledge becomes explicit in articulation of how the facilitation of the workshop moves forward, and which adaptations and changes are necessary to conduct.

There is a close connection between co-design and learning. Using co-design as a pedagogical approach strengthens collaboration. Creating something together that materializes in either workshops, exhibitions or installations is different to other ways of facilitating learning within a science museum. The collaboration with Stephen and Shukran has stretched over nearly four years and through it we can trace another understanding of the role of museums in society. Moreover, it has brought new insights into the theme of race and a pronounced knowledge about how to facilitate a creative process. Meanwhile, our main goal was to understand how a science museum can support conversations around controversial issues, what a museum must prepare for these dialogues to happen and how to bridge this insight into civic life. For the children involved, their experience was only based on one single four-hour workshop. Even so, the collaborative format of the activities scaffold conversations on scientific issues across age and experience that can bridge into everyday life. Nevertheless, it contributed to an understanding of what young people and children expect from a learning activity at the museum. This reflects the well-established expectation of learning when entering a science museum. For the museum, working long-term with young people adds new insights and knowledge about this specific age group, while

twisting the roles and responsibility around leads to different kind of professionalism as a museum educator. There are no simple answers to how we communicate and learn science. It is multifaceted process.

In some aspect the collaboration with our co-designers manifested in an expressed feeling of ownership to the FOLK exhibition and the familiarity with the museum team. Followed by an increased capacity related to the FOLK topic and make connection to the contemporary society, with its challenges on viewing diversity.

Moreover, it is important to recognize that knowledge and insights transport across contexts of everyday life; in school, at workplaces during leisure activities and within the framework of a science museum (Barnett and Jackson, 2019; Drotner and Erstad, 2014). As an example of this fusion of everyday and school learning, two of the children who were friends and schoolmates, had an easier entrance to suggest a game by making scenarios of a visit to the museum with plastic play figure. During the evaluation of the workshop, the insights of how the social dynamic worked within the workshop reminded Shukran and Stephen of their experience from the first phase. This underpins the knowledge and experience Shukran and Stephen brought with them into the co-design process and how it developed during phase 2. The fact that each one of us are experts in our own lives regardless of age, training and profession is important to facilitate when knowledge develops collaboratively in co-design processes.

Learning and knowledge are closely connected, in the ways we acquire knowledge, or deepen our understanding and develop our skills through active engagement with our experiences all through life (Hodson, 2014; Pritchard, 2018a). In view of this reflection, Stephen and Shukran are co-researchers as they actively interact and articulate – knowledge moves from tacit to explicit (Nonaka et al., 2000) in the awareness of how interests, colour of skin or clothes may be a reason for isolation and silence in collaborative situations as well.

As this case have shown, there is within the frame of a science museum a possibility to support young people in acquiring skills communicating socio-scientific issues. Furthermore, as a museum one has to take notice of the insights that are dependent on

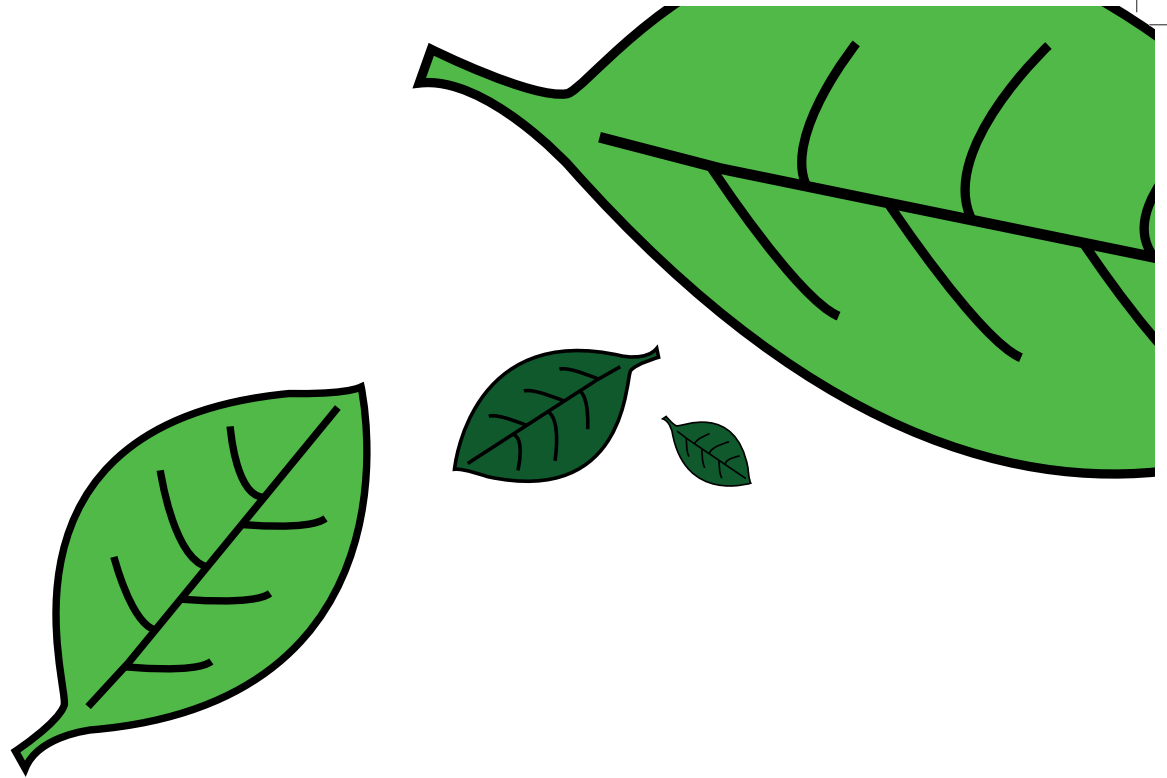
the context of where new knowledge emerges with a transfer potential to other areas in life. Our co-facilitators took their task very seriously, adding some elements of their own initiative. As Stephen noted, the semi-structured frame of the meetings and workshop provided an opportunity for new ideas to emerge. The twist we attempted by inviting Shukran and Stephen as main facilitators managed to attenuate our roles as organizers and facilitators. It gave us the possibility to better observe, and it made the young people active co-facilitators, with a concrete task.

Bibliography

7. Science, Identity and Belonging: Future Workshop: a structuring tool for co-designing with young people

Professional Paper

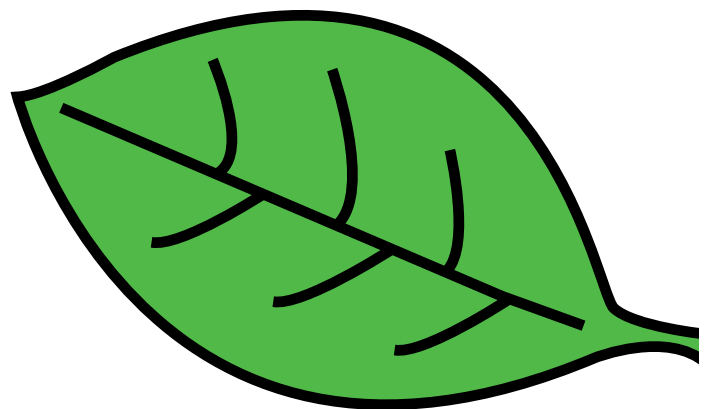




Science, Identity and Belonging

Future Workshop: a structuring tool for co-designing with
young people

**Torhild Skåtun, Curator Learning, Norwegian Museum of Science and Technology
(NTM) PhD researcher, School of Museum Studies University of Leicester**



What type of critique

In a museum, it is common to test and evaluate programs, but visitors are rarely engaged in the development phase.¹ Such involvement requires the museum letting go of knowledge control, and rather facilitate for emancipatory participation and reflection through praxis and dialogue.² Inspired by the tradition of Participatory Design (PD) that arranges for people to collaborate on creating artefacts that shape their lives,³ we arranged a series of co-design workshops called Science, Identity and Belonging (SIB) using the Future Workshop (FW) approach. The method was developed in the 1970s for empowering individuals and groups to be active participants in urban planning processes. The point of departure is to critique the present situation, in our case a museum exhibition in development and on display.

First, we involved a group of young people (aged 16–19) in designing a digital sound installation for the exhibition *FOLK: From racial types to DNA sequences* (FOLK). A year later, we invited two of the young people to lead a FW co-designing a learning activity for children (10–13) related to the same exhibition.

This article reflects on these two rounds of co-design interventions. We watch our young partners transform into co-design leaders and seek to elaborate on FW as a method that facilitates both the production of outcomes (exhibits, programs) and the development of deep and meaningful partnerships. The actions and reflections connected to planning and adapting the FW will be in focus.



The Sound of *FOLK*: Young people creating soundscapes. Photo: Håkon Bergseth

Motivation of the Museum

Museums hold potential to be a space where citizenship is enacted through reflection, discussion and negotiation.⁴ Museums can also be third spaces⁵ where difficult contemporary societal issues are confronted. This was the case with the *FOLK* exhibition, which dealt with the impact that scientific racial categorization has had on how we understand humans today.

A participatory project that incorporates active involvement with objects and societal themes in the museum space can empower groups and individuals. Beyond participation, there is the opportunity to bring visitor engagement behind the scenes, as such projects open up possibilities for museum visitors to influence the development of museum programs and exhibitions.⁶

As part of the development of the exhibition *FOLK* at NTM (2016–2018) we reached out to a group of eleven young people with experience of growing up in a multicultural district. This collaboration with young people from Grorud Youth Council took place in a series of eight workshops before the exhibition opened. Together we co-designed the digital installation *The Sound of FOLK*. The co-design process was a parallel endeavor to the exhibition development, with the involvement of the exhibition curator alongside the museum educator in the co-design group ensuring fruitful exchanges between the two processes.⁷

In the second stage of the collaboration, two of the young people, Samir and Steve*, took over as leaders to co-design further educational programs together with children. With our support, they planned, facilitated and evaluated a four-hour FW putting their previous experience of museum co-design into practice.

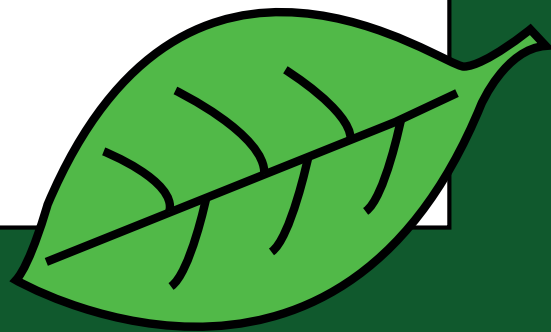
The purpose of the project was to develop a co-design process that involves young people working together with museum professionals on an equal level. The collaboration and joint decision-

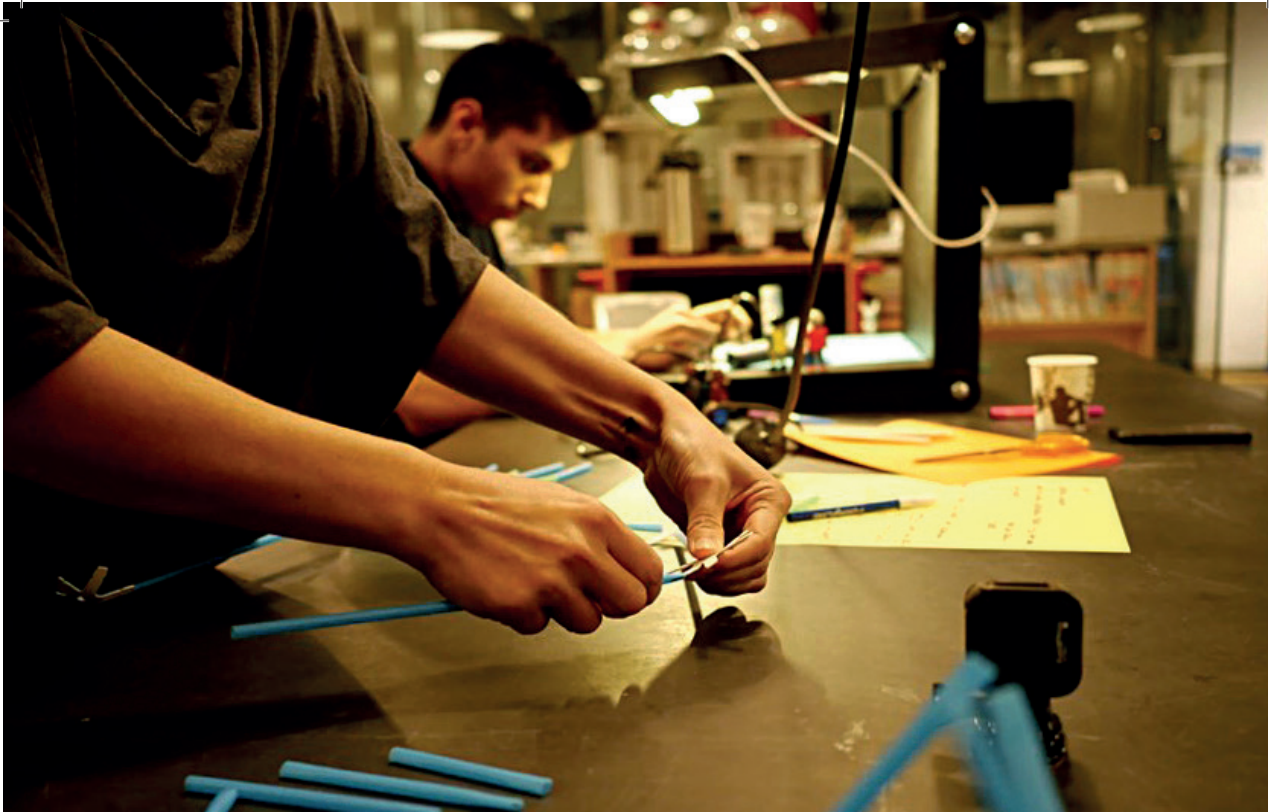
making on the conceptual level between museum professionals and youth underlines the bottom-up perspective of development. The initiative aims to enable young people to handle participatory processes, as well as to lead the design activity, an approach that necessitates letting go of some institutional control over both processes and outcomes.⁸

Method and implementation

Future Workshop (FW) is a technique that focuses on the development of future-facing solutions to societal problems through criticizing and analyzing existing situations.⁹ In the context of museum exhibition design, it offers useful processes and tools for the public's meaningful participation.¹⁰ Involving young people as leaders of FWs in the second part of our co-design work also contributed to broadening our understating of the usage of FW. It has four phases: preparation, critique, fantasy and realization. It suggests a way forward through a series of stages that end in a realistic, feasible suggestion.¹¹

*Not their real names.





Fantasy phase, a scenario that illustrates a future digital sound installation. Photo: Tobias Messenbrink

Co-design with young people

We met the young people eight times over a period of a year. Starting with a brainstorming session around terms like identity, ethnicity and belonging, our initial meetings focused on exploring the exhibition topic and digital possibilities using sound. After four explorative workshops, we needed a stricter structure on the co-design; FW helped us in scaffolding the process for the last six months of the collaboration.

When arranging an arena for *critique*, we chose to analyze the exhibition *Typical* at the Intercultural Museum in Oslo. At *Typical*, we were all visitors; it had a similar theme and the target group was young people. Though there were many interactive elements and films, the texts attracted criticism, as becomes clear in one of our co-designers' remarks:

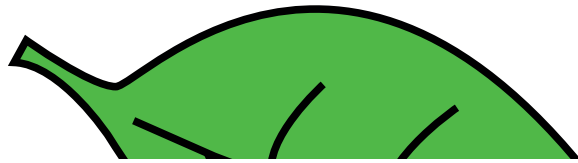
“[...] the videos were very well thought through, then I got to the information ... Too much text can become boring.”

During the *fantasy phase*, we used a small scene for ‘playing out’ ideas for visitor activities. In this phase, it is important not to have any boundaries or constraints of a financial or physical nature. The young people were divided into groups of three or four, including museum professionals, with the aim to produce three scenarios.

Through voting for the best solution, and then integrating good ideas from the other suggestions, the *realization phase* resulted in the development of a design concept for a sound activity. This was then programmed into a prototype which, after being evaluated by the co-design participants (young people and museum colleagues), was implemented and tested with exhibition audiences. *The Sound of FOLK* opened at the same time as the exhibition *FOLK* opened in March 2018.

Co-design by young people

A year later, the second participatory intervention in the *FOLK* exhibition took place. Samir and Steve themselves led and facilitated a single four-hour FW with children to co-design a museum learning activity. The young men led the *preparation phase*. As before, the introduction activity should



have included brainstorming around terms like belonging, identity, ethnicity with the addition of the word selecting. However, our workshop leaders, who had been critical from the beginning as to whether terms such as 'identity' and 'belonging' would be understandable to children, facilitated other activities, resulting in a longer brainstorming session.

They undertook the *critique phase* within the *FOLK* exhibition and highlighted the children's views on the lack of interactive elements.

In the *fantasy phase*, the young leaders helped the children to use plastic figures on the scenes in drafting a learning activity. This worked well in one of the groups as they quickly started to playfully outline an activity.

The chosen learning activity to be *realized* included finding museum objects, in small replicas, and putting them in a basket. Then a movie telling the story of the chosen objects would start. This, as Steve pointed out, would require participation beyond 'just look and read'.

Theory

A co-design process revolves around making something together, and tentatively erases the boundaries between experts and non-experts. Furthermore, we can view the co-design process as an artefact in itself, as an assembly of actions.¹² In the way FW has been used in these two cases, the participants have been given the opportunity to tell, make and enact future scenarios in the museum,¹³ away from the known fields of their school, home or neighborhood.

Experience

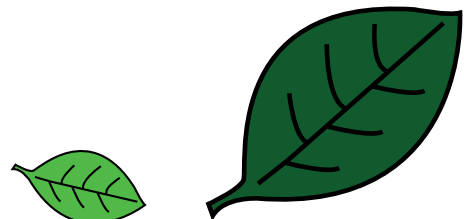
Using critique as an approach involving young people in the various processes contributed to a better understanding of the museum's role in society. The Future Workshop method emphasizes a critical look at the present. Furthermore, it contributed to equality among the co-designers, children, young people and museum professionals. It opened up the museum to critique, invited change, and required our readiness to act on these terms.

Working together with Samir and Steve for two years allowed us to identify practical changes that needed to be made to the method and to our approach to visitor involvement and participation. The first series of workshops revealed, for example, the importance of trust between older participants, which should either already exist or be given time to develop during the collaboration. Younger children can be immediate in their relationship building, and it is apparent if a situation does not suit them.¹⁴ In the second workshop there should have been more time to get to know and trust one another. It became obvious that the participants that came as friends fell more easily into interaction mode.

Facilitating for co-design processes provides a possibility for museum professionals to get a deeper understanding of how young people relate to the museum. They are often considered the most hard-to-reach, yet, at the same time, the ones we wish to reach. It is challenging to be relevant to young people. As one of our collaborators expressed, to be seen as connected to the museum (e.g. in social media posts) was out of the question as it would mean being seen as a 'nerd' or a 'loser'. Overcoming young people's views of being associated with the museum as the equivalent of social suicide is a challenge that participation initiatives need to conquer.

How to go forward with the project

While using Future Workshop as a method to structure co-design involving non-experts and experts, keep the attention on trusting the abilities of young people.¹⁵ See them as experts in their own lives. FW may contribute to practicing new curriculum aims such as in-depth learning, critical thinking and source criticism.



Kilder

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⁶ Dagny Stuedahl, Torhild Skåtun, Ageliki Lefkadiou and Tobias Messenbrink, "Participation and dialogue: Curatorial reflexivity in participatory processes," in *European Heritage, Dialogue and Digital Practices*, ed. Areti Galani et al. (London: Routledge, 2019), p. 62–85. To be downloaded: <https://www.taylorfrancis.com/books/e/9780429053511/chapters/10.4324/9780429053511-5>. [Accessed 08.01.2020.]
Gustav Taxén, Vasiliki Tzibazi and Simona Bodo all discusses this in their articles.

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Curriculum 2020

The participatory project supported

Critical thinking and ethical awareness
Creativity, engagement and exploration
Democracy and citizenship
Sustainable development
In-depth learning

FOLK from racial types to DNA sequences:
discuss and elaborate on the ideals of human
dignity, discrimination and the development of
racism from a historical perspective with a view
to the present.

Tips

Be very aware of power relations

The co-design process must be
rewarding for all participants

Have plenty of time to recruit

Be flexible, make adjustments and be
open to changes of plans

View co-designers as experts in their
own life

NORGES
MUSEUMS
~ FORBUND



8. Discussion and conclusion

This practice-based PhD research endeavour has been driven by my curiosity about a science museum's potential to engage with young people in and through co-design processes. My gaze has been directed towards my own workplace, NTM, where the cooperative activities, occurrences, and dialogues have happened.

As the series of workshops were the museum professionals' and young people's shared experience, they became our common point of reference, our 'boundary objects' (Star, 2010; Star and Griesemer, 1989). The workshops represented our sharing and negotiating of knowledge and understandings, something that each of the two groups understood differently (for museum professionals they were a platform for generating insights for exhibition design; for the young people they were an extracurricular out-of-school experience); and yet remained stable in time and space with recurring events such as sharing food, working in groups and joint conversations around the table.

When the outcome of the process is open, new connections have the potential to occur. In SIB, following the co-design endeavour we created positions for some of our young participants as assistant explainers during a two-month period when the museum had expanded opening hours. SIB expanded our common experiences and contact points, to include more than the workshops and the tools that are available at the museum, so that the museum's audience activities also became a common experience, and thereby new connections surfaced (Leigh Star, 2010).

The way forward to the finished installation was paved by small and big decisions, and recognising one's own individual contribution may not always be easy (Bratteteig et al., 2013). However, viewing the outcome as our own is both rewarding and empowering. In his master's thesis, my colleague Tobias Messenbrink argued that during prototyping, our partners liked the way one could be creative with sound and share it with other visitors. However, they often asked for a possibility to upload images and text that connect the sounds closer to the exhibition *FOLK* (Messenbrink, 2018 p. 88). However, we are impressed by the work effort, as Tobias point to in his reflection after workshop 3: *"All in all, I think the results show a wide range of different techniques and tools and I am impressed by what was created in a short time. I was sceptical about what they were going to achieve with such difficult topics and such abstract tools, but both my own observation and comments in discussion gave the impression that the tasks*

triggered creativity and a different approach to the topic than in previous conversations.”

This observation underscores how our partners experienced the design process as having led to something they could vouch for. This was given a clearer physical representation in the form of a fixed installation that in many ways can be experienced as a recompense for the effort, individually and as a group. Despite coming into the workshops with different expectations and prerequisites and leaving with a variety of experiences, we created a sound installation that satisfied the requirement of expanding the contributions. The outcome of our collaborative endeavour was the Sound of *FOLK*, which in many aspects must be said to be a success. During its lifetime of 21 months, around 5000 sound expressions were created.

My enquiry examined the ways the museum and the collaborative partners are impacted by the knowledge that is produced through these interactions (Bunning et al., 2015; Simonsen and Robertson, 2012; Tzibazi, 2013), as I will discuss in section 4.1. This curiosity has been nurtured by my exploration of socially engaged practices (Sandell, 2016), and how these can be strengthened by staging collaborative processes that blur the trodden traditional tracks such as expert versus non-experts (Knudsen, 2016; Smith and Iversen, 2014; Stuedahl and Skåtun, 2018). Moreover, I have looked into how facilitating for close collaborations with people who do not necessarily find the museum relevant to their lives, may broaden how the science museum understands itself in relation to the society it serves (Dawson, 2018; DeWitt et al., 2019), which I discuss further in section 4.2. Finally, I have examined if and how a science museum can become part of a young person’s learning ecology by viewing the temporalities of the meetings as spaces where knowledge moves and flourishes (Pritchard, 2018). I discuss this further in section 4.3.

In the following, I will discuss my papers and bring in perspectives from the podcast that are illuminated by viewpoints I have elaborated on in my literary review and in my descriptions of how the project proceeded. My research questions will frame the discussion and my concluding thoughts on my co-design endeavour. Central to my discussion will be to view the workshops and meetings with partners as the boundary object that is stable in time and space in terms of the events that took place during them, yet is still open for several understandings in terms of what these events meant to different partners (Hetland and Schröder, 2020; Star and Griesemer, 1989; Vavoula and

Mason, 2017). I will start by looking closer at how co-design within the spaces of a museum is impacted by and in turn impact a knowledge creation process at an individual and an organisational level.

8.1 Co-design and knowledge processes

The hallmark of co-design is to try to thoroughly understand the partners involved in the collaboration, with all the different knowledge and perceptions they bring with them. Through this question I look more closely at the creation of knowledge and at how the museum can understand itself in relation to its collaborative partners. Moreover, I examine how these participatory practices challenge museums to re-think their way of staging programs and exhibitions to allow taking a step back and inviting partners in a common exploration behind the scenes of museum development that fosters engagement and mutual learning.

8.1.1 Creating spaces for collaborative reflection

Museums—along with schools, libraries and universities—are institutions in society where the individual meets the state, providing a place where active citizenship can be negotiated and developed (Bennett, 2013; O'Neill and Hooper, 2019). As Allison Druin (2017) points out, PD should also be about giving a voice to those who have few arenas in which to be heard, such as in the SIB case: young people and children. It is important for a museum to have the courage to initiate collaboration where the outcome is a bit unclear in order to foster dialogue with the surrounding communities and further the democratic potential of museums. As I point to in my research log *“My experience has been that this has not been clear to any of us and then we cannot expect that our participants have really understood it. On the other hand, this has contributed to the process being open and the outcome not clear.”* The SIB project differed in many ways from other participatory efforts in the field of museums. Its cross-disciplinary research design involved several departments at NTM as well as researchers from outside the museum and participants from the community. On an organisational level, the collaborative process with Grorud Youth Council focused its attention on programmes that reach people who do not belong to our main visitor group. At the same time, the Norwegian government has recently offered guidelines on diversity, and projects

focusing on inclusion have been welcomed (Department of Culture¹⁰², 2021). In the SIB project the knowledge travel across disciplines internally, in conversations with external researchers and the culture spheres participants represented.

The creation of knowledge in and between the workshops followed the development of the exhibition closely. The exploration of the *FOLK* themes and experimentation with the sound media generated conversations along several axes: between the museum professionals involved, with the *FOLK* exhibition group, among the youths and with the museum as a whole. Yet, and despite being able to point to features of the final product that they recognised, some of our community partners felt that parts of the installation had been created in-between the workshops in their absence, without them having contributed. From this I can draw the conclusion that museum spaces hold a potential to be places for conversations around identity, science and ethnicity, despite the fact that the process shifts between openness and closedness. Importantly, the follow-on co-design that involved our young partners as facilitators demonstrates how the museum can also function as a safe space for the sharing of thoughts and further reflections on the co-design process, leading to deeper relationships with community members and improved co-design processes.

In this dialogical space where we all perform with our different approaches and knowledge, facilitating an exchange of viewpoints encourages everyone to make meaning together, trying to encode and decode, to learn and un-learn (Ehn, 2017; Hall, 1997b; Simonsen and Robertson, 2012). Together we tried out, negotiated, adapted, and created, through several entry points in the making of the interactive digital installation. While the experimenting with historical photos and recording of self-written texts in workshop 4 did not directly contribute to the installation, it nevertheless brought museum objects into dialogue with museum professionals and youths, providing continuity as well as focus. Such an approach of joint interrogation of objects and collections challenges existing knowledge structures and creates space for pluralism in interpretation and understandings: the activities brought out our partners' own notions of past and origin, as elaborated on in the paper on “Engagement through co-designing in a science museum”.

¹⁰² Museum in society, Trust, things and time (2020 – 2021) <https://www.regjeringen.no/no/dokumenter/meld.-st.-23-20202021/id2840027/> accessed 11.11.2021

8.1.2 Rethinking the museum's 'sociality'

As the workshops took place after closing hours, we had the whole museum as a playground, which in a way expanded the room for interaction, as we moved freely around in a space close to the objects, and its materiality intersecting through actions and conversations. For example, during the first meeting, curator Ageliki took the whole group to the medical gallery where sounds from a hospital were used as a narrative element. This introductory experience allowed us all to watch and feel the atmosphere of an exhibit with a special attention to sound uninterrupted by the normal, shared use of the space during opening hours. In fact, this casts the sociality of the museum under a different light, contrasting the focused sociality within a 'community' group of co-designers with the cross-sectional sociality of the 'general public'.

The discussions within the co-design group needed to be negotiated with and translated for the rest of the exhibition team. Our reports from the workshops had an impact on the framing of content of the *FOLK* exhibition. For example, the visit to Typical! where the museum medium was scrutinised, contributed to discussions about the layers of information in *FOLK* that connected to themes and objects. One co-design partner's comment that "*I liked the possibility to go in depth if one wanted to*" and another "*...I didn't feel like I had to just read, I could also observe and still get a lot of knowledge, that things happen in different places, that it gives a bit of a multi-layered experience*" was discussed and had impact on the exhibition design, the levelling of texts, archive material, films, and objects in *FOLK*, which ended up featuring drawers to pull and a dark room for viewing relevant videos. The co-design process was strengthened by the presence of one of the main curators, Ageliki, in all the workshops. Her interest and curiosity towards the methods and the youth group provided a strong voice when we translated and negotiated the way forward with the rest of the exhibition team (Morse, 2013; Schorch and McCarthy, 2018). This productive dynamic between the co-design group and the exhibition team through Ageliki's mediation, reveals another way in which co-design can be the go-between the museum and its communities.

8.1.3 Participatory museum practices, creativity and knowledges

As stated in the introduction, we aimed at expanding the voices in the exhibition making process during the collaborative creation of the Sound of *FOLK*, which is the reason why we established the partnership with Grorud Youth Council. The process facilitated

for close conversation with a group of young persons on a topic that strengthened and completed curatorial reflexivity within the whole exhibition team. The museum professionals' reflections in and around the co-design process pointed to the need for constant movement between pluralisation and stabilisation (Graham, 2016). To stage a creative conversation between the actors, it was important to understand stability as a temporary condition, as something that happens in a meeting, a conversation or through interaction, as discussed in paper 1 (Curatorial reflexivity in participatory processes). It is as if stability appears in some moments before taking a new step into a dialogue between the participatory actors.

As our attentive co-designers pointed out, initially we did not quite know what we wanted to make, which provided inspiration, especially as the first exploratory workshops were more open. What product the co-design would lead to was an open question, and this openness was experienced as uncertainty by our co-design partners, an insecurity that was in line with the literature which emphasises co-creating for an unknown future (Smith and Iversen, 2014; Van der Velden et al., 2014). The slightly chaotic start of the workshops and loose direction was in a way what we had planned, considering that the process would be open (Bannon and Ehn, 2012; Björgvinsson et al., 2012; Dantec and DiSalvo, 2013). Nevertheless, the museum team searched for methods to scaffold the creative process. Before the inception of the SIB case, we had made some pre-decisions—such as wanting to work with sound—and we were always responsible for planning and facilitating all the activities. However, the workshops did not unfold according to a pre-defined plan, but were rather based on an iterative approach where each step was evaluated before deciding the next step. This semi-structured format requires a considerate reflection on what has taken place and how to move forward, how to re-focus and which methods and tools are required. I express after workshop 2, that I am "*Satisfied that so many young people turned up, but the fact that they arrive at very different times can hinder the flow of the session. It became a bit hectic and difficult to achieve everything we set out to do in a roughly two-hour session.*" The cross-disciplinary discussions that took place after each workshop, forced an articulation of opinion and understanding to surface into a conversation that drove the process further (Ash, 2019; Schön, 87; Skydsgaard et al., 2016).

Keeping in mind that design as a concept is always re-design, the point of departure is something that already exists in the world (Latour in Binder et al., 2015). The SIB

project employed a design approach where museum exhibitions and programmes are the design point of departure. A co-design process is defined by the feature of bringing several people together to create a space for multivocality, placing dialogue and action in the centre of collaboration (Dysthe et al., 2013; Evans and Achiam, 2021; Galani et al., 2019; Morse, 2020; Sørensen, 2021). Our partners brought with them prior knowledge and understanding of what a museum exhibition is and what a museum program can contain and how it is designed. For example, Tobias notes in his reflections after the first workshop:

The participants seemed to be somewhat skeptical about the topic of sound. Several comments reflected that sound can be exciting, but preferably in connection with/as a supporting element for visual media. (Tobias, workshop 1)

However, the explorative and creative format of the first workshops allowed them to break with the notion of what a museum traditionally does and provided space for new thoughts and ideas to surface.

8.1.4 Issues of control

While the co-design outcome was open to negotiation with our co-design partners, significant control remained with the museum team. The curator, Ageliki, was the one with the insight on the subject of the exhibition and with the authority to decide what was to be on display or not. Tobias with his technological skills also made several decisions while programming the sound installation. I was the organiser and lead facilitator; in relation to the participants, I was the one in control of their payments and was in contact with their leader at Grorud Youth Council. For my own part, I experienced having a great deal of power and taking up a lot of space in the workshops, both in how we used the museum room as a whole (for which I had a key) and how the activities were led. Recognising this power imbalance motivated me in the next round of co-design interventions to involve Shukran and Stephen as facilitators who went on to lead the planning, conduct and evaluation of the co-design workshop with the younger children. This fortified our partnership with them in terms of process control. Museum professionals and researchers always lie ahead of the collaborative partners, which require treading carefully when re-manufacturing the way forward (Palmås and

Von Busch, 2015). On several occasions and in slightly different ways, our young partners commented that a lot happened between the workshops without them being a part of it.

“After this process, we lost it a bit. Then, in a way, our thing was finished. Then it was like the job was done.” (Shukran, 18 years)

Thus, the co-design activities were perceived as open and at the same time closed, in line with literature on the field we juggled in the middle, trying to hold a steady course toward the opening of *FOLK* (Black, 2012; Stuedahl, 2018). Just by the feature of making a plan for the time we spent together in the workshops, however loose and flexible as it may have been, it still imposed an agenda to the meetings. This agenda is then a form of control over the process that remains with those who organise and facilitate the meetings. In reflecting on practice with my co-designers, this became evident. Although the goal was by no means as straightforward for our partners, they had at times a quite different understanding of what the workshops were to accomplish. Shukran readily recognized that the trajectory of the co-design endeavour changed and moved and he commented in the podcast that it was as if SIB was a new project every time we met. The mutability of the project also manifested itself in the discussion of where to place the Sound of *FOLK* installation. The fact that our co-design sessions took place after closing hours meant that the ordinary day-to-day life in the museum café, reception and galleries was hidden from our co-designers. At the same time, our activities were not visible to other museum staff, including the museum director, the *FOLK* exhibition development team in its entirety and the front desk staff. While I noted earlier that this may have enabled our co-design team to think beyond their preconceptions of what a museum is and what it does, at the same time the team may have missed out on perspectives (of these other staff members and the museum’s daily operations) that could have contributed to the project (Lynch, 2017; Modest, 2013). What we can see here is the impact of superimposing co-design meetings with their distinct occurrences in time, onto the museum exhibition design process that takes place continuously over a defined period of time. While the two processes may start and finish at the same time, exhibition design evolves throughout that time while co-design can only evolve when all co-design partners meet, inevitably playing catch up with the developments that have taken place in exhibition design. While Ageliki, Tobias and I were bridges between the two, bringing our impressions, understandings and

misunderstandings from the co-design workshops to the exhibition development, the two were still parallel unconnected processes. To an extent, this hampered the mediating role of the co-design partnership between the museum and the Grorud Council Youth community, who felt that the co-design project was often progressing without them, as the museum team undertook the planning and reflecting upon the workshops, and reporting to the exhibition design team.

8.1.5 Co-design and audience-centred design for engagement

The dialogues during co-design sessions worked in many ways, so that we became more familiar with objects and topics that could be complex to discuss, preparing us for the conversations that could occur in the meeting with the general public through the *FOLK* exhibition. Despite the unevenness power of process control in the co-design group, it still allowed for different insights and knowledges to surface, and for opinions to be equally recognised and valued. Thus, a conversation about the DNA kit led the curator to realise that this object was important to put on display, as it obviously sparked curiosity as well as controversies. An inquisitiveness was also articulated by students participating in the co-design of the learning program, both in their sound stories and in asking questions during a tour of the exhibition. The co-production of knowledge together with our young partners has provided for a sharpening of the interpretive skills of the museum professionals (Bunning et al., 2015; Graham, 2016). As the first phase of SIB ran in parallel with the making of the *FOLK* exhibition, the conversations also functioned as an entity to sensitise us and adjust to the exhibition topic. As our young co-designers were part of our future intended audiences, our co-design workshops were, in a way, themselves part of the *FOLK* exhibition programming (Stuedahl et al., 2021). As a result of this experimenting with digital sound activity, we developed a learning program that activated the exploration of the exhibition by letting students (as described in chapter 3.4) express themselves with sound, as described in chapter 3.4, in between the two SIB phases.

Our experimentation with sound in the four initial workshops placed sound as an object for interaction and engagement. These actions and dialogues had supported the process of exposing and sensitising visitors as well as museum professionals to the affordances of the medium of sound and using it to frame co-creativity within the museum space. Co-design thus functioned as a medium exploration instrument, enabling the unfamiliar to become more tangible and its engagement potential to be exposed.

At the beginning our young partners were not particularly interested in sound as a medium for interaction. Nevertheless, in a follow-up interview, they described how they ended up developing a close relationship to sound as a medium that they recollect fondly. Furthermore, sound is something that surrounds us without always noticing it, and in phase one, we gave attention to this particular medium (Dindler and Iversen, 2014; Mansell et al., 2022; Messenbrink, 2018). This focus enabled us to transpose both the medium and everyday life sounds into the museum space: moving objects and placing them in a new context is a hallmark of a museum (Brenna, 2014). In paper 1, on the other hand we discuss how participatory practices try to bond the conversations with and beyond the museum artefact (Graham, 2016). In this case, the sound interactions functioned as an opener to exploration between the museum and the youth, as sound in many ways is fluid and invites different transmissions across knowledge and understandings (Lacedelli, 2018) .

The choice of community to partner with (Gorud Youth Council) was to a large extent shaped by the FOLK exhibition topic: it made sense to partner with a diverse community when the topic we were negotiating through FOLK had to do with identity and belonging. Through our partnering with the young people we were aiming to overcome the limitations of our own skillsets, which did not include lived experience of cross-cultural background; our partners from Gorud brought with them their own experience and embodiment of diversity. Shukran points this out in the podcast when he compares his and his peers' background with that of the four children who participated in the phase two co-design. In a way, his comparison of different degrees of exposure to diversity encompasses two different viewpoints. First, Stephen points out that it is difficult to put the experience of identity into words, and that in encounters with children who do not themselves have experience as a visible minority, other ways to understand identity have to be found. To facilitate conversation with these children, Stephen and Shukran felt that using the children's lived experience of school playground friendship groups and how personal interests (such as climbing and playing instruments, see dialogue in chapter 3.5) become what draws people together. Shukran built on Stephen's explanation of identity in the workshop to elaborate, in dialogue with the children, how having a cultural background that originates in another continent is another way to consider 'identity'. In enabling these interactions among members of different community groups, the museum becomes more multifaceted, with an

expanded set of interlocutors who educate, each other and the museum.

8.1.6 Response to Research Question 1: How does co-design in a Science Museum impact, and in turn is impacted by, knowledge creation processes at individual and organisational level?

Co-design provides a space for collaborative reflection among the co-design team that propagates up to the museum (in this case, the FOLK exhibition design team). Museum objects and collections catalyse these reflections, kindling discussions and reflections without displacing the focus on understandings of the exhibition themes that co-design partners bring with them.

Our co-design fed into the FOLK exhibition design in many ways. The output we produced, the Sound of FOLK exhibit, became part of the exhibition; it encapsulated the co-design partners' shared understanding of 'identity' and 'belonging'. Led by our co-design partners, our interpretation focused on emotions and feelings, an angle that the museum design team would not have explored otherwise. Furthermore, the potential of specific objects (like the DNA kit) to intrigue and engage audiences was highlighted, prompting their use in the exhibition. The co-design process and its outputs gave us insights into how the FOLK exhibition might engage audiences. At the same time, the creativity entailed in co-design invited and enabled our community partners to reconsider what the museum is and how its exhibitions and programming can work to engage.

The discussion above highlighted the tensions between the volition to openly co-design with community partners on equal terms, and the need to respond to the timetable and project management of the FOLK exhibition development. The latter imposed a frame on the former that meant that pushed the co-design to progress in tandem with the FOLK exhibition. The museum team inevitably played a bridging role, which on one hand facilitated the propagation of co-design outcomes and findings up to the FOLK design team, and on the other hand the handing down of co-design "progress" that occurred in-between workshops. The latter included progress in the planning of the co-design itself, with the museum team pre-planning the focus and structure of each workshop. Ideally, this too would have been a collaborative activity, in a way similar to the second co-design phase of SIB, where the workshop was collaboratively planned with and facilitated by our community partners. Such involvement can perhaps alleviate

the feelings of uncertainty over where the co-design exercise is headed and further reinforce equality between the museum and its co-design partners.

8.2 Co-design spaces for dialogical interactions

Co-design challenges the museum's authoritative narrator voice and provokes conversations around who gets to speak in the museum (Bennett, 2013; O'Neill and Hooper, 2019; Witcomb, 2020), by questioning what expertise is and probing us to consider and choose which roles to perform in interactions with our community partners. As discussed in the literature review, perspectives on democratisation and the right for co-determination of conditions that matter to a person's life arise from the origins of PD in Scandinavia in the seventies (Ehn, 2008; Simonsen and Robertson, 2012; Stuedahl, 2004). In our case, however, the museum was in many aspects not a known setting for interaction like the work environment was when PD first emerged; this led to a need for sufficient time as well as opportunities to explore together with our co-designers what a museum exhibition is and can be – a process that broke the boundaries of professional expertise to enable it to embrace lived experience.

8.2.1 Breaking down barriers

Our young collaborative partners were reluctant to move the location of the workshops to their neighbourhood. As many collaborative projects have been criticised for always asking the participants to come to the museum and not the other way around (Modest, 2013), we were curious to know if moving the co-design processes would benefit the process by shifting the power balance. We were seeking the impact of young urban people on the co-design process with their perspectives as multicultural youth, highly relevant for exploring the *FOLK* theme. To seek out the youth where they lived their daily lives may have allowed other connections and dialogues to happen, but we do not really know. It is obvious that when all participation takes place in the museum space, an uneven balance of power may arise, and the participants can quickly become guests rather than co-producers (Bell et al., 2009). Yet our partners attributed to the museum space the potential to be liberating for thoughts and actions, as one of our partners expressed:

I think that if you came to us, I do not think honestly that we could come so far, because of the environment over there, it is like our home and we are a little

sceptical towards being open, I think. Because in the museum we were coming to a new place and we were more open-minded... (Stephen, 19 years)

Stephen expressed this view towards the end of our four-year partnership, and it shines through that both he and Shukran experienced ownership towards the museum, the exhibition, and our digital installation. However, it does not exclude that a preliminary phase could have taken place at the premises of Grorud Youth council. Such an act would strengthen our co-design partnership as it would have given us, the museum professionals, the opportunity to be the visitors and experience the discomfort that our partners experienced when they came to the museum: it would have levelled the playing field even more.

Science museums have a strong tradition of developing learning programmes that emphasise activities and dialogue and strengthen different learning styles. Even so, museums rarely enable a two-way communication (Galani and Moschovi, 2010), let alone having awareness of and experience with genuinely participatory practices like co-design (Eikeland, 2020; Sandholdt, 2016; Stuedahl and Skåtun, 2018). Although for many young people science museums represent a familiar learning environment, few have taken part in the open structure of a co-design process within the science museum. Even collaborative exercises within the science museum's learning programmes, rarely enable participants to communicate with and be heard by the museum. This is contrary to what a co-design process supports, namely facilitating participants in acting, sharing and communicating when creating together with museum professionals (Dindler and Iversen, 2014; Morse, 2020; Mygind et al., 2015; Tzibazi, 2013).

In SIB we used a variety of technologies and props to scaffold our collaboration: tablets to experiment with and edit sound, mobile phones to record sounds and reflections, plastic figures to stage scenarios of museum visits. These were technologies familiar to all in the co-design team, that further enabled the breaking down of expertise barriers and facilitated our collaborative work tasks and activities.

Phase two saw our two community members join the co-design team as facilitators, a role change which, as elaborated in paper 3, required a different professionalism of the museum educator, and involved stepping back and relinquishing control (Ash, 2019; Rudman et al., 2018). A move that facilitates for a more equal cooperation, it made us partners in research and development with our common experiences as the pivot point. Moreover, this blurring of expert and non-expert roles provided space and air for a

dialogue, which became especially clear during our “final reflection” meeting. At this point issues around the number of participants and the fact that some didn’t know one another was discussed, providing guidance for the museum team’s planning of upcoming collaborative interventions.

8.2.2 Co-designing in a space of care

In a desire to create a safe space for interaction on an equal footing, engaging in co-design encouraged our focus on care—for example, by ensuring that we serve food and allow time for small talk in combination with acknowledging everyone's input and thoughts. In a way, the process emphasised care for the topic itself by bringing past understandings and actions into the present through active exchange of knowledge about contemporary issues (Morse, 2020; Olsen et al., 2020; Stuedahl et al., 2021). The complexity of facilitating such conversations on controversial issues becomes evident, as pointed out in paper 3, where the museum transforms into spaces of dialogue where opinions, feelings and understanding are shared and valued. As co-design is closely connected to participatory practices, it is important to take into consideration the difficulties in properly understanding the user’s needs, values, cultural and societal assumptions (Lynch, 2011; Mygind et al., 2015).

The conversations around the process forced collaborative reflections among the museum team as well as within the whole SIB group where we had to position oneself in relation to others. This reflexivity brings an understanding of the different roles, expectations, and knowledge. As discussed in the previous section, it enables the museum to take the role as facilitator for a knowledge creating process in contrast to its usual role as teacher. Likewise, our partners were challenged to learn about the cultural institution, and the museum professionals must relate their institutional knowledge to external collaborative partners. As pointed out in paper one (Curatorial reflexivity), several of our partners were overwhelmed by the complexity of creating an exhibition. As they put it, they had never thought that so many people were involved and with so many details to think about. But the demarcations between external “amateur” partners and the museum become blurred as the dialogues surface based on the shared experiences of the workshops. This common space for interaction became more prominent in the second phase where the four partners (Shukran, Stephen, Dagny and me) worked alongside each other, sharing the trust and responsibility to a greater degree (Clarke et al., 2021; Smith and Iversen, 2014).

This extract from our evaluation meeting, where the discussion was led by Shukran and Stephen, and we were reflecting together on the workshop with children, gives an insight on this process:

Shukran: I think micro-writing was good because I think you somehow made them think and say more about it.

Shukran: It provided a little more overview.

Stephen: And then it is not certain that people dared to say things out loud. Then it's nice to write it on a sheet, then we kind of get it printed out. Without them noticing. We just take it as a whim.

As mentioned in the previous section, blurring the distinction between experts and non-experts establishes spaces for mutual learning. This was highlighted in our discussions around the pedagogical assessment during the podcast when Shukran and Stephan used the workshop with children as an example of the necessity of making plans to be prepared because we did not know what would work. It became clear that to be in charge for a workshop is an exercise of balance between scaffolding interactions, having a plan and letting go of control, accepting that actions and dialogue not always goes according to plan (Lynch, 2011; Mygind et al., 2015). Nevertheless, with a pragmatic and flexible approach within a safe space for interactions conversations flourish and connections can be made (Dindler and Iversen, 2014; Katrikh, 2018; Vavoula and Sharples, 2007).

An unexpected contributor to the caring, comforting atmosphere of the co-design workshops was the choice to use the medium of sound. As one participant expressed it, it was somewhat ‘hyggelig’¹⁰³ and comfortable to work with sound. Digital sound recorded on the mobile phone contributed to connecting the museum visit with everyday life. Whether it was the sound itself that gave an experience of cosiness, or that it was the transition of one medium from one reality into the museum space, is difficult to pinpoint. Either way, to be encouraged to express how one connects to the material, in this case sound, obviously produced a nice feeling. As described in paper 2

¹⁰³Definition of the word, hygge: ‘A quality of cosiness and comfortable conviviality that engenders a feeling of contentment or well-being’, <https://www.lexico.com/definition/hygge>, date accessed 08 November 2021.

and in the case description, these activities are associated with something unusual and pleasant and are remembered long after the event. This connects to the literature on the field in respect to changing contexts of items, elements of surprise and establishing a mastering environment for co-creating (Dindler and Iversen, 2014; Iversen et al., 2017; Morse, 2020; Smith and Iversen, 2014).

8.2.3 Silence and familiarity

During the process of making the Sound of *FOLK*, the museum staff tried to put aside their expertise, aiming at facilitating an open dialogue where all viewpoints had equal value. Acknowledging the fact that everybody is a novice and an expert at the same time, brings forward a common exploration and emphasis on mutual learning (Bannon and Ehn, 2012; Brandt et al., 2012; Nicholas et al., 2012). Mostly our conversation took place around a roundtable, be it introductions, a talk on the topic given by Ageliki or a review of sounds the participants had brought with them. Regardless of our focus on an open appreciative dialogue, the professionals' power of facilitating and organising was never really relinquished. Around the table were several lines of relationships: among the youth, between the museum and the youth, and among the museum staff. As Shukran pointed out in the podcast, it was in a way easier to remain silent and wait for others to speak up. So, providing room for some silence and not always try to fill the gaps with words becomes important. Even though allowing for silence can at times be unpleasant, particularly for a museum pedagogue, who is used to being in control of the activities and see it as his or her task to actively encourage conversations among participants. In my research log after the second workshop, I write: *"I'm just a bit bad at being quiet and felt a great need to start a process"*.

In phase one all workshops were led by me or one of my museum colleagues, we simply did not consider handing over this responsibility to our young partners. As mentioned previously, and elaborated on in the workshop where we experimented with making of sound-stories, the dynamics among the young co-designers's group were unknown to us, as we did not know them very well. If we had attended their Grorud Youth Council meetings, or taken part in their conference on young participation, we might have become better acquainted before embarking on co-design. Nevertheless, this made us reluctant to let some selected individuals stand out. I have mentioned that we could have asked the young people to take an active part testing the sound installation together with visitors, but there existed an opportunity to swap the role of leading the workshops or to

give the floor to the youths to present, an opportunity we did not grasp. Handing over the facilitator role earlier on in the process holds a potential to reinforce a shared ownership and provide an opportunity to articulate perceptions of what is happening in the workshops. Insights and knowledge would be transported between the different contexts, possibly more fluently and with a stronger engagement in the dialogical interactions.

8.2.4 The role of workshop method and structure

We, the museum team, planned, evaluated, and wrote research logs in parallel to extensive reading of theory in the field, a combination that encouraged a self-awareness through reflection on practice during and in-between the meetings; as well as maintained confidence during the workshops (Akama and Light, 2020; Ash, 2019; Schön, 1987). Such awareness included a recognition of the positioning of oneself in relation to the whole co-design team: on one side the collaborative young people, and the professional team on the other. Nevertheless, we took advantage of establishing a group crosscutting these demarcations, as when we in the implementation phase (workshop 6) set up mixed work groups. The conversations about a visitor journey, which was the given task at the time, resulted in three suggestions for a museum's activity related to FOLK.

When a museum reaches out to the community to collaborate and create programs, explore collections, or create digital installations with, it is naturally important to recognize the knowledge expressed through interaction and dialogue. At the same time, the museum must facilitate in a way that makes the collaboration stronger, that the processes build capacity for the individual participant and that they are treated respectfully. In other words, the museum must always have a plan so that no individuals or groups are exploited, and so that their insights in the long run become a contribution not only to the museum's development, but also provide experiences that people take with them further in life. In its simplest form, such expertise is recognized through certificates and as a reference for future job searches. In our case, we went a step further by acknowledging participating in the dialogical interactions and the time it took, by awarding a small honorarium. Such recognition shows that the museum values its co-designers as equal partners.

8.2.5 Response to Research Question 2: How do co-design processes transform the museum into a space for dialogical interactions between experts and non-experts?

SIB showed how museum professionals (experts) and community members (“non-experts”) can be brought together in dialogical interactions, facilitated by the workshop structure and methods, the choice of physical location, the choice of tools and technologies, the choice of media, and the inclusion of monetary rewards.

Central to the functioning of a co-design group is rapport and familiarity among its members. In phase 1, it took a while for the museum team to get to know our young co-designers individually and to identify their strengths and areas of expertise. In phase 2, while making progress in sharing control by inviting two of our phase 1 co-designers to lead, the younger children we invited to the co-design were unknown to us and each other, which slowed down the creative activities. Rapport and familiarity take time to develop, and their development is best done before the actual co-design begins. Visiting each other in their space may contribute to mutual understanding and rapport building – in SIB this was an opportunity we missed, as the museum team did not create opportunities to visit the Youth Council’s premises.

Instrumental to the levelling of the field between experts and “non-experts”, which is a pre-condition for dialogical exchange (Davies 2010), was the use of tools, technologies and media that were familiar and accessible to all. In SIB the importance of this was apparent both when our tool choices worked well, for example when we used mobile phones to record sounds and plastic figures to create scenarios of use; and when our tool choices did not work, for example when we tried to keep communications going through a closed Facebook group. When the choice is right, these tools and props support creativity and scaffold dialogues.

The choice of tasks and activities that structure the co-design workshops and the style of moderation also influence the quality of the dialogue. In SIB we found that creating opportunities for small group work among a mix of museum staff and non-staff gave opportunities for more intimate dialogues and more productive interactions. We also identified value in silences, which the moderating style needs to accommodate. While in interactive education programmes the silence pupils may indicate lack of engagement, in reflective and creative endeavours like co-design silences can be integral to mindful engagement.

Bringing these together is a mindset of care that the museum needs to provide for the community members it engages. In SIB this had two aspects: care for our co-designers' personal engagement with the difficult FOLK exhibition topic of scientific racism; and care for their valued contributions to museum work.

8.3 Co-design and learning and engagement ecologies

By virtue of the fact that co-design provides a framework for collaboration and joint exploration, there is a potential for different worlds of learning and experience to be linked together. In SIB, we explored various entrances to how these bridges could be strengthened, and new connections made. With conversations and actions central in the set-up of workshops, we also attempted to use social media to create additional meeting points. Central to all interaction were various aspects of digital media, and the conversation about how this could link a museum activity to everyday life.

8.3.1 Connecting to life-worlds

The workshops provided scope for conversations around identity, ethnicity and belonging, and how these concepts connect to the affective part of being a human in society. The FOLK exhibition focused on race and its long story as a scientific discipline and its impact on today's society. The first co-design meeting put the exhibition theme at the forefront: without going into depth, we rather facilitated for actions and dialogues on equal footing by performing the same task, together trying to strengthen our capacities to put into words the feelings that the exhibition theme generated. In my research log I wrote "*Where we all jotted down keywords under each category. A task the young people started on right away.*" Our common associating around the mentioned concepts, expanded the range of affective words. Later in the process, these became materialized in the way the *Sound of FOLK* was staged, by placing feelings as the point of departure for interaction with the topic of the exhibition. Co-design in SIB thus provided opportunities for young people to act and reflect more thoroughly in collaboration with museum professionals. It made room for focus and subsequent engagement through dialogues and an increased understanding and knowledge for all partners. In doing so, it enabled them to connect their personal life worlds to the co-design project.

Throughout SIB we used and discussed digital media: audio was collected on mobile phones and shared in the group, and we had discussions about how to scaffold the

digital installation. In this interaction space our partners were given space to showcase their skills and express their opinions and understandings, both about the usage of the digital equipment and about media sharing.

One other thing we noticed in phase 2 of SIB is that, given the opportunity, co-design partners will bridge spaces of learning. This was evident when Shukran and Stephen translated two activities, the colour-dot-game and the naming of the colour of one's toothbrush, which they had experienced in other learning settings, framing to fit the co-design workshop with the younger children.

8.3.2 Prolonged engagement

The SIB project led to a new intervention, moving from designing *with* to designing *by* young people. Nevertheless, to create a safe space for sharing and interaction requires spending time together, to make small talk and share food in a friendly atmosphere (Folge et al., 2013; Katrikh, 2018; Morse, 2020). In an ordinary programme, there will be little time for small talk and hence difficult to start a conversation that is not connected to the topic of the learning session. However, my experience as a museum pedagogue stretched beyond leading a learning program and I brought with me a mindset concerning how to facilitate conversations about objects with people with dementia. This mindset aims for a close and equal dialogue staged around the sharing of biscuits and coffee, as described. In spite of that, if one looks at the future of curatorship, I think collaborative practices will connect the processes of exhibition making closer to the society (Schorch and McCarthy, 2018; Stuedahl et al., 2021). In this context, co-design holds a focus on the process and facilitation of activities that may provide several engagements and mutual learning opportunities for both the museum and the collaborative partners.

A science museum is used to facilitate participation and interaction through learning programmes and interactive science installations (Bitgood, 2010). In practice, there is an inconsistency, in that museums often fail to give space for participants to be in control of their own experience. In this sense, it is an entirely different form of participation to create something together in a co-design process. Facilitating a medium- to long-term joint creative exploration provides opportunities to focus on subject matters over time. This contrasts with the shorter-term learning programmes where no close relationships can be forged, for example when an entire class of 28 students participates in a two-hour

programme. SIB's prolonged co-design process, where partners get to know each other well, and where spaces and breaks were created for conversations about other things in life to surface. In other words, where opportunities for small talk and sharing of food occurred (Morse, 2020). As my note below highlights "*This time, too, we started by eating pizza, the young people got into pools a bit and the meal stretched from 1715 to almost 6 pm. (Torhild, workshop 2)*".

This colours the way museums think about participation, especially when tackling complex societal issues. The methods that are in the core of co-design – co-determination, power awareness, multivocality, translations, negotiation and mutual learning – can be put into play when one collaborates across departments and with external partners.

Processes that provide opportunity for closer interactions over a longer time span enable group members to know one better, something rare in a typical educational situation at a museum where students often remain nameless. In SIB co-design partners came from different age spans, cultural backgrounds and life stages, similar to a teacher-pupil relationship (albeit with different power relations at play, as the museum was not in charge of 'grading' the partners' work). Yet, through co-design interactions the young people came closer with the museum staff, initiating during workshop breaks conversations and asking for advice about their choices of university study and about careers. In other words, they related to us with the trust and ease they relate with their teacher or counsellor at school. This underlines that during co-design, other connections occur that go beyond the 'boundary encounter' (Meyer, 2010). With reciprocal curiosity and genuine interest in one another, these networks pave the way for a collaborative inquiry that may blur the distinctions between the young person and the museum (Knudsen, 2016; Mygind et al., 2015; Smith and Iversen, 2014).

This sense of familiarity and human closeness, combined with the sense of valued contribution to the co-design process, had another side effect in SIB: our co-designers began to talk about "our exhibition", referring to the *FOLK* exhibition with a clear sense of ownership and even pride. These feelings developed gradually, and resulted for example in them expressing concern that there were no activities to engage with inside the gallery space (see workshop 5) and that being able to contribute to an exhibition (such as in the *Anatomy of Prejudice* at IKM, figure 20 on 127) gives a feeling of being included. The museum thus became something that mattered for our co-design partners,

even though their starting point was one of detached, arm's-length interest.

Two other factors may have contributed to this transformation. One is the openness of the process that I have discussed already. This not only gave us an experimental zone with room for misalignment and time to correct and change along the way, but also disrupted the traditional 'teacher' role which museum often perform (Bennett, 2013). This may have made the museum more 'relatable'. The second factor is the scheduling of the workshops outside of museum opening times and firmly into the young partners' leisure time, reinforcing the feeling that this not a school experience.

A final factor that may have strengthened our partners' engagement is the act of facilitating co-design workshops. Light and Akama (2020) describe 'poise' as the way one's body is balanced and interacts with the environment in which one performs. In SIB, 'poise' was one of equality among co-design partners, be it when we were brainstorming associations for the main exhibition topics or when we were interpreting the exhibition *Typical*. With practice, the facilitator learns to handle situations with confidence (Akama and Light, 2018; Ehn, 2017) and make use of body language and eye contact with awareness of one's own body in space and always aiming to make participants feel secure, even when from the facilitator's vantage point, groups appear to be struggling a bit with their tasks. In my professional paper I pointed out that museum pedagogues are trained to create safe spaces for dialogue and to handle situations that may occur (Hooper-Greenhill, 1999; Simon, 2016; Winstanley, 2018). Also, one is trained to promptly establish clarity and trust, by clarifying tasks and roles our partners are expected to fulfil. A museum pedagogue is expected to engage in activities that require collaboration and problem solving. All educational programmes are in essence about facilitating a safe space for dialogue, especially if the educational programmes are organised around making, conversation and creating (Bernhardt et al., 2012). Educators are used to scaffolding learning activities that bring forward questions, reflections, and dialogues among participants in the space between objects and people. However, what is missing from the museum pedagogue's repertoire is giving the floor away, being more withdrawn in their performance. In SIB I learned the value of these qualities, which led me in phase 2 to hand the facilitator role over to my co-design partners who were thereby prompted to devise their own approaches to facilitation.

8.3.3 Partnering with young people

In making the digital installation the Sound for *FOLK*, we collaborated with young people, an age group that is attractive to museums but is also considered hard to reach. It is important to consider how young co-design partners are approached and welcomed into the group.

Long-term collaborations like those involved in co-design projects should be addressed to the part of the youth population that has the most to gain from collaborative projects. In other words, it is important that projects like SIB have an element of real empowerment, something that is easier to ensure when there are fewer participants involved over a longer period of time. One reason for initiating these time-consuming and extensive processes is the way they enable a dialogue with individuals who, in a larger picture, can be seen as representatives of the whole society (Drotner et al., 2021; Stuedahl et al., 2021).

For the young people who participated in SIB, museums are places they have to visit with their school and connect with learning activities within a special frame. As mentioned earlier, all the youths in this project had previously being to the NTM with their school, but only one out of eleven had visited the museum with their family. SIB seems to have reached out to groups of young people who do not regard visiting the museum as part of their life beyond compulsory education. Nevertheless, this is not to undermine the value of other leisure activities or to suggest that museums have exclusive rights to being an arena for personal development for young people; but to point out that they can be places with a potential for the individual to meet society in active interaction. Design with young people over a longer period of time and in close collaboration, enables a deeper insight into how young people learn and what they like to do (Druin, 2002; Iversen et al., 2017).

Tzibazi (2013) underlines the importance of trusting young people and their ability to act and collaborate with museums. This was particularly important in SIB where the museum reached out to find young partners who we thought would have something important and original to say on the topic of the exhibition, stemming from their personal experience and everyday life. SIB aimed to open the conversation beyond the FOLK exhibition team, keeping in mind that knowledge exists and develops in the meeting between people individually and is negotiated through language, conversation and interaction.

Important for the coherence of the co-design group is the reinforcement that comes from the sense of ownership of the outcomes. I have already commented on the sense of ownership and pride that our co-designers showed about the FOLK exhibition. The Sound of *FOLK*'s particular focus on affect was co-developed with our partners, and was adopted by the whole team, despite the irregularity with which some of our young partners attended our meetings. As I understand it, the notion of affect had become an integral part of our thinking, including among the museum team, from the technician to the curator. This fuelled its propagation across varying co-design compositions from one workshop to the next. Reinforced by my energetic presence in the workshops when a new participant appeared, I always tried to ease them into the SIB project and bring them onboard the decisions taken thus far, including the focus on affect. As I note on in my research log: *"I hope we handled them more as independent individuals and that we managed to analyze the exhibition and next time can ask questions about their personal perception."*

8.3.4 On (workshop) method

As described in chapter 2.9, in the second half of SIB phase 1 we used the Future Workshop method, which orchestrated many aspects of the process for both the museum professionals and the young people. It structured the creative phase and helped us to move forward. Even so, the young people experienced the first half of phase 1, pre-Future Workshop, as more open for them to influence. Looking back, I am pleased that the two halves were complementary and ordered in this way, as they gave us space and time for making sense together and understanding before embarking on more structured creativity.

Traditions of PD/Co-design have their origins in democratic problem solving, as does the Future Workshop method (Ehn, 2017; Jungk and Müllert, 1987; Stuedahl, 2004; Vidal, 2005), highlighting ways to enable citizens to have a say in matters that concern their life. However, it is uncertain if and how this open approach with time to experiment can be transferred to a regular learning offer in the museum. On one hand, I think many elements, such as the creative open-ended way of facilitating for learning, can be found in museum programmes like 'maker' activities. On the other hand, such programmes lack a depth in the affiliation that may arise between the museum professionals and the co-producers. As one gets to know each other better, the possibilities of shaping long-lasting bonds is more present in long-lasting processes like

SIB's co-design. Getting to know each other by name, sharing future dreams and plans, differs from the interaction between the museum and participants in a typical one-off learning programme (Bitgood, 2010).

To organise for co-design within the settings of a science museum as the SIB did is time consuming and requires close attentiveness at all stages. In many ways, co-design is an extended learning programme where the aim is for participants and museum staff to learn together (Sørensen, 2021). To approach the hard-to-reach segment of the public, it remains a challenge to move the process beyond talking with the "usual suspects". In SIB, the theme of the FOLK exhibition prompted us to look at Grorud's youth, a community that the museum had not engaged with before. And it paid off.

8.3.5 Response to Research Question 3: How can co-design affect the way that a science museum understands itself as an active agent in young people's learning and engagement ecology?

SIB has shown how the museum can connect with young people's life-worlds in meaningful ways. From inviting them to draw on their everyday skills (increasingly digital and media-related) and prior experiences, to prolonged engagement that brings invites to view the museum as their own, SIB is testament that co-design that is done with care results in partners who care about the museum in personally meaningful ways.

Traditionally, educational programmes in museums do not last long, perhaps four hours at the most. Already in the 1930s, pedagogues promoted more activity-based entry points to learning, challenging the transmission model (Brenna and de Ridder, 2018). SIB demonstrates an understanding of the learning and experience ecology as interventions into the spaces and places where young people learn and vice versa, in between leisure, school and museums (Hodson, 2014). Co-design encourages the cultivation of connections rather than considering the different institutions of teaching separately. This leads to a process that lasts longer than a typical educational programme and orchestrates more complex interactions from which new questions and affinities arise. Museum programmes can create attention and spark interest. A participatory programme that lasts for a longer time than a usual formal learning activity, requires other competencies. This provides an opportunity for the museum to listen more closely and not just make plans on their own but bring partners into the planning phases and let them make decisions and gain their own understandings.

I would also add the importance of the partners having an open-minded curiosity, in combination with a consciously positive view of people. It is important to create environments that reinforce and appreciate the knowledge and understandings the participants bring with them into the collaboration. Moreover, it is important to keep in mind how knowledge and engagement have emerged dialogically, how they have travelled across the different contexts: among the partners during the co-design workshops and in the gaps between the meeting points, in the intersection between the museum and the professionals involved in the co-design, in the relationship between the young people and the science museum. In turn all these conversations and actions have had an impact on how the museum's space can be understood dialogically, as a place where people with different insights and knowledge can work together. Additionally, it is encouraging for the museum that our SIB partners experienced that discussing and entering in collaboration within the framework of a museum brought forth new thoughts and reflections. This was made possible by the combination of closeness to the collection, having the exhibitions to oneself and being invited "behind the scenes" in a phase of development. An appreciation of collaboration and curiosity about what it will deliver, combined with a belief that young people have a lot to contribute and trust, helps to create safe interaction spaces.

A co-design approach can cultivate connections between the different learning and engagement domains that are part of a young person's life (Drotner and Erstad, 2014). There are features of co-design that are worth looking at when it comes to understanding science museums in particular as part of a learning ecology. The open-ended character of the collaborative process creates possibilities for longitudinal relationships that provides an opportunity to forge stronger bonds with the public. However, to facilitate for in-depth engagement over time with focus on building young people's resilience requires time and resources.

8.4 Concluding thoughts

My co-design partners shared their viewpoints, thoughts, and perspectives in the podcast, as well as while been involved in co-authoring the paper *Knowledge development through co- design actions and dialogue* (Skatun et al. in preparation). The foundation of our common reflection was the conversations while planning and evaluating phase 2 of SIB. Moreover, their response to the text itself brought myself and

my academic co-author's reflections forward (Gay y Blasco and De La Cruz Hernandez, 2012). Highlighting what was important for them, they asked us to describe the activity they brought with them into the workshop more thoroughly:

“Thought that you maybe could write about the colour-game we had, where we put coloured dots on the forehead of the children and saw how they grouped themselves without talking, I think it was written about in section 3.4. It is entirely up to you if you want to take it in, but I personally felt that it was important for this project” (Email from Shukran Kaakal, 2020–10 07)

Here we can see that one's own contributions are remembered and perceived as important. It was this opportunity to actively be part of making decisions on how to organise the workshop which I had overlooked. The process of co-authoring a research output that analysed and discussed these workshops also gave Shukran and Stephen the opportunity to make decisions on how the co-design workshops are remembered and co-decide which activities were significant.

Giving attention to co-design and linking it to the life of young people can disrupt the museum's understanding of its mission in society as a learning institution. It is a conundrum, that many science museum activities are perceived as resembling school, though the museum aspires to represent a different kind of experience. Co-design challenges museums to relinquish power and responsibility and expand the role of our audiences; SIB went as far as offering opportunities to become co-facilitators and co-researchers. Correspondingly, co-design creates space for young people to interact with the museum in close conversation on topics that are difficult, complex, and sensitive, interactions that can transit onto acting as humans in the society. However, the time and resources that co-design collaborations require mean that such experiences cannot be rolled out at scale and call for the museum to reach out to young people for whom such experiences can make the most difference.

During SIB I collaborated with a variety of individuals and groups, including colleagues with different professional disciplinary backgrounds and responsibilities in connection with the *FOLK* exhibition at NTM. This was a cross-disciplinary format that placed SIB close to the development of *FOLK*, fostering a collaboration between curator, educator, and technician, which in turn impacted the positioning of the co-design process within the museum as a whole and in the exhibition team. The external partners have consisted of museum researchers and ten youths from the Grorud Youth Council, and later

extended with a group of four children. As a continuation of the co-design of the *Sound* exhibit, we established a closer collaboration with two of the members who have been closely connected to the project over two years. Our common point of departure was the eight workshops of SIB's phase 1, a common frame of reference that I understand as our boundary object (Leigh Star, 2010; Star and Griesemer, 1989), although new connections and opportunities materialised along the way.

To plan, carry out and reflect on a research project such as this, from within the museum organisation, has its strengths and weaknesses. On the one hand, the critical perspective is somewhat weakened due to commitment, understanding and consideration to the museum of where I belong. Conversely, the opportunities for influencing the entire organisation are greater when networks and knowledge are created and strengthened with outside partners and across the museum. In the case of SIB, the process has led to new collaborations and projects. One reason may be that with a knowledge of how decisions are made at management level, it is easier to gain internal approval to apply for project funding. At the same time, the project itself established a contact with resource persons with whom it was subsequently easier to create new projects and collaborations. One example of such a collaboration which Shukran and Stephen took part in concerned the maker space workshops at youth clubs and in local libraries, a project that was made possible by the museum taking the initiative to apply for grants together with Grorud district. Moreover, the project also led to the museum offering free group tickets to Grorud residents over two summer holidays in a row, after our contact person in the Grorud district expressed that it was very expensive to visit the museum.

Currently, while I am completing this thesis, new partners are appearing under the auspices of Oslo Municipality and will collaborate on new projects, be it at the museum or out in the boroughs. Collaborative processes such as the one described in this thesis, where professionals are working together across disciplinary boundaries together with prospective users, have the potential to push the museum profession further (O'Neill 2006). This leads to complex negotiations between museum professionals and departments. In the co-design interventions discussed in this thesis, which extended over time, members of the co-design team were neither visitors, users nor impersonal members of the public; the collaboration was between an invited group of partners and four museum professionals of different backgrounds and interests.

I will end this research project by suggesting that further research on co-design practices

that crosses engagement contexts to blend the learning trajectories of young persons and children is needed, especially considering that a science museum could take a stronger societal role by offering spaces of interaction across leisure and school. To achieve this, we need collaborative mindsets and methods, placing young people at the pivot point of museum development. Moreover, connecting a group of young people for a longitudinal project may shape new ideas for projects and cooperation's. As shown, I am curious if shared ownership and handing over control will open doors for young people to act within the spaces of a museum. Additionally, as this research and co-design project have mainly been carried out in the exhibition spaces, close to where the museum's visitors normally stay. Proposing a project that moves even closer to the collections and challenges and discusses the selection of objects will facilitate the museum to work on longer lines of participatory practises. Moreover, it has the potential to drill further into the purpose of the handling and understanding of a science museum collection and its role in society.

Appendix 1:

torsdag, 2. februar 2017

Hei,

Teknisk museum utvikler for tiden en utstilling som omhandler begrepene rase, identitet og etnisitet med åpning våren 2018. Vi skal se nærmere på hvordan et museum kan øke forståelse for kulturarv, vitenskap og teknologi i samfunnet gjennom nye metoder for program- og utstillingsutvikling. I den forbindelse ønsker vi å invitere ungdom til en serie workshops som skal foregå parallelt med utviklingen av utstillingen. Våren 2017 planlegger vi flere pilotworkshops der vi skal arbeide med temaet for utstillingen og drøfte muligheter for å skape et tilbud som lar besøkende diskutere og reflektere over temaet. Hvis workshopene blir vellykkede planlegger vi en fortsettelse til høsten hvor vi ønsker å la deltagerne aktivt bidra i designet av en digital installasjon til utstillingen eller et tilknyttet program for skoleklasser. Til å være med i gruppen ønsker vi ti ungdommer som er opptatt av identitetsspørsmål og å skape aktive holdninger om vitenskap som en sosial og kulturell praksis i dagens multikulturelle samfunn. Vi anser at hver og en bringer inn forskjellige perspektiver og spiller en vesentlig rolle i å genere kunnskap. Prosjektet vil være opptatt av at prosessen skal være nyttig og lærerik for alle involverte parter.

Fra mars til juni inviterer vi til fire verksteder fra kl. 17-20 her på Teknisk museum eller på en møteplass i sentrum.

Vennlig hilsen

Torhild Skåtun

Teknisk museum

Translation

Thursday February 2, 2017

Hi,

The Technical Museum is currently developing an exhibition that deals with the concepts of race, identity and ethnicity, opening in spring 2018. We will take a closer look at how a museum can increase understanding of cultural heritage, science and technology in society through new methods for program and exhibition development. In this connection, we want to invite young people to a series of workshops that will take place in parallel with the development of the exhibition. In the spring of 2017, we are planning several pilot workshops where we will work on the theme of the exhibition and discuss opportunities to create an offer that allows visitors to discuss and reflect on the theme. If the workshops are successful, we plan a continuation this fall where we want to have the participants actively contribute in the design of a digital installation to the exhibition or an associated program for school classes. To join the group, we want ten young people who are concerned with identity issues and to create active attitudes about science as a social and cultural practice in today's multicultural society. We believe that each one brings different perspectives and plays a significant role in generating knowledge. The project will be dedicated to making the process useful and educational for all parties involved. From March to June, we invite you to four workshops from 2 pm. 17-20 here at the Technical Museum or at a meeting place in the city center.

Sincerely,

Torhild Skåtun



Appendix 2:

Information Sheet for Participants

For guardians of children,

Project Title: Science, Identity and Belonging

Contact Address: Teknisk Museum, Torhild Skåtun, Kjelsåsveien 143, 0491 Oslo, phone: +4795171220, ts298@le.ac.uk

Date: October 2018 -April 2019

Science, Identity and Belonging – workshop participation

In the spring of 2018, The Norwegian Museum of Science and Technology opened the exhibition “FOLK - From racial types to DNA sequences. This exhibition deals with scientific research on human biological similarities and differences, and how such research may affect our understanding of identity and belonging. In the autumn of 2018 and spring of 2019, the exhibition and a digital sound installation, which supplements it, will be evaluated, while a learning program will be developed through workshops with children. The workshops will be run by two young people from “Grorud Youth Council” in Oslo, who have co-produced the sound installation with the Museum.

We appreciate your participation. The child in your care is invited to participate in these workshops.

The background for these outreach activities is a wish to develop a better understanding of participatory processes. Our focus will be on exploring how museums hold the potential to foster engaged citizenship through participatory practices, exhibitions and activities. The project is underpinned by the following questions:

- *How may participatory processes in a Science Museum generate knowledge for all participants?*

- *Can digital activities function as a motivational factor in increasing interest for technology, science and cultural heritage for young people?*

- *How are the exhibition and the digital activity received, connected and interpreted?*

The child in your care will be invited to participate in a Saturday workshop at the Museum, that will last for approximately three to four hours. Together with the participants, the researchers will evaluate and explore how the use of a sound media installation can connect with the exhibition in creating a learning program. All young participants will be observed in interaction with the exhibition theme, and will be interviewed in groups.

The group interviews will take place as part of the workshop. Young participants will assume the role of co-creators, in collaboration with us researchers.

Participation in this research is voluntary and the child will be free to withdraw from the project at any time before the 1st of December 2019, without having to give a reason. If you are uncertain or uncomfortable about any aspect of your participation, please contact the researcher listed at the top of this letter to discuss your concerns or request clarification on any aspect of the study.

Protecting your confidentiality

Any information on you or the child in your care will be treated confidentially. All young participants will be anonymized by using pseudonyms instead of their real names, unless you ***explicitly request*** to be named in the research. Data will be collected in the form of written notes, audio and video recordings. All data will be encrypted and stored safely on two external hard disks, which will be stored in the Museum's safe, and only the named researchers will have access to this data. All data will be kept in accordance with the General Data Protection Requirements (GDPR). Notes and videos collected will be confidentially and securely destroyed at the Norwegian Museum of Science and Technology at the completion of the PhD writing up.

Project manager, Torhild Skåtun, is currently a PhD candidate at the School of Museum Studies, University of Leicester. As part of her doctorate, she is developing co-design and co-creation practices in the science museum, and as part of this research, she has facilitated several co-creating workshops with young people and children.

The research partners in this project are Norsk Teknisk Museum/The Norwegian Museum of Science and Technology; Torhild Skåtun PhD candidate at School of Museum Studies, University of Leicester, UK and Dagny

Stuedahl, Professor at Oslo Metropolitan University.

We assume that each of you will bring in different perspectives and will play a significant role in generating

knowledge. The project will strive to be useful and rewarding for all involved partners.

Thank you,

Appendix 3:

Consent form for parents:

Consent form for Guardians of Children

On behalf of my pupil or child I agree to take part in the **Science, Identity and Belonging** study which is research towards a PhD at School of Museum Studies at the University of Leicester.

On behalf of my pupil/child I have had the research project explained to me and I have read the Information sheet about the project which I may keep for my records.

I understand that this study will be carried out in accordance with the University of Leicester's Code of Research Ethics which can be viewed at <http://www2.le.ac.uk/institution/ethics/code>.

Material I provide as part of this study will be treated as confidential and securely stored in accordance with the General Data Protection Regulation 2018.

I have read and I understand the information sheet	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I have been given the opportunity to ask questions about the project and they were answered to my satisfaction	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that the children in my care can withdraw from the study at any time before the 1st of December 2019.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I agree to the workshops that my pupil / child in my care participates in to be photographed and filmed, and that my pupil's / child's in my care words being used in a doctoral thesis.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I agree to my pupil's / child's in my care words and photos being used in related academic assignments and publications, including on the Internet.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that my pupil's / child's in my care personal details including his or her name will not be used in connection with any words that my pupil / child in my care has said or information he or she has passed on.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I request that my pupil's / child's in my care real name is acknowledged in any publications that reference the comments that he or she has made	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that all notes, audio, and video recordings will be destroyed securely at the finish of the PhD and will be done so at the Museum premises in Norway to comply with GDPR guidelines	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Name [PRINT]

Signature

Date

Consent form for participants (children):

Appendix 4:

Consent form for participants

I agree to take part in the **Science, Identity and Belonging** study, which is research towards a PhD at School of Museum Studies at the University of Leicester.

I have had the research project explained to me and I have read the Information sheet about the project, which I may keep for my records.

I understand that this study will be carried out in accordance with the University of Leicester's Code of Research Ethics which can be viewed at <http://www2.le.ac.uk/institution/ethics/code>.

Material I provide as part of this study will be treated as confidential and securely stored in accordance with the General Data Protection Regulation 2018

I have read and I understand the information sheet	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I have been given the opportunity to ask questions about the project and they were answered to my satisfaction	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that the children in my care can withdraw from the study at any time before the 1st of December 2019.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I agree to the workshops I participate being photographed and filmed, and that my words and photos being used in a doctoral thesis.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I agree that the workshops I participate in my care words and photos being used in related academic assignments and publications, including on the Internet.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that my personal details including my name will not be used in connection with any words that I have said or information I have passed on.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I give permission for me to be named in connection with any words that I have said or information I have passed on.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I request that my real name is acknowledged in any publications that reference the comments that I have made	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that all notes, audio, and video recordings will be destroyed securely at the finish of the PhD and will be done so at the Museum premises in Norway to comply with GDPR guidelines	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Name [PRINT]

Signature

Date

Appendix 5:

Information Sheet for Participants

For young people, workshop leaders,

Project Title: Science, Identity and Belonging

Contact Address: Teknisk Museum, Torhild Skåtun, Kjelsåsveien 143, 0491 Oslo, phone: +4795171220, ts298@le.ac.uk

Date: <COMPLETE>

Science, Identity and Belonging – workshop participation

In the spring of 2018, The Norwegian Museum of Science and Technology opened the exhibition “FOLK - From racial types to DNA sequences. This exhibition deals with scientific research on human biological similarities and differences, and how such research may affect our understanding of identity and belonging. The exhibition incorporates the ‘Sound of Folk’ digital sound installation, which you helped to co-design in 2017.

In the autumn of 2018 and spring of 2019, the exhibition and a digital sound installation, which supplements it, will be evaluated, while a learning program will be developed through workshops with children. As experienced co-designers who have contributed to the Sound of FOLK, you are invited to lead these workshops in collaboration with myself and other museum staff.

In this project I will have a dual role, as museum educator and as doctoral student. My PhD research focuses on developing a better understanding of participatory processes and their potential to engage young people with the museum. With your permission, I will use these co-design workshops to explore how museums hold the potential to foster engaged citizenship through participatory practices, exhibitions and activities. My research is underpinned by the following questions:

- *How may participatory processes in a Science Museum generate knowledge for all participants?*
- *Can digital activities function as a motivational factor in increasing interest for technology, science and cultural heritage for young people?*
- *How are the exhibition and the digital activity received, connected and interpreted?*

You are invited to lead co-design workshops at the Museum where younger children aged 9 to 12 will be invited to create a learning programme related to the FOLK exhibition and the Sound of FOLK installation. To aid me with the analysis of our co-design activities and with your permission, I will video-record parts of the workshops and I will take notes. I will also invite you to interviews, at the beginning and again at the end of the series of workshops. The interviews will take place at the museum.

Participation in this research is entirely voluntary and you are free to withdraw from the project at any time before the 1st of December 2019, without having to give a reason. If you are uncertain or uncomfortable about any aspect of your participation, please contact me using the contact details at the top of this letter to discuss your concerns or request clarification on any aspect of the study.

Protecting your confidentiality

Any information you provide will be treated confidentially. Information that is used in my thesis will be anonymised by using pseudonyms instead of your real names, unless you **explicitly request** to be named in the research. All the data from the audio/video recordings will be encrypted and stored safely on two external hard disks, which will be stored in the Museum’s safe, and only I will have access to this data. All data will be kept in accordance with the General Data Protection Requirements (GDPR). All data, notes and videos collected will be confidentially and securely destroyed at The Norwegian Museum of Science and Technology at the completion of the PhD writing up

The research partners in this project are Norsk Teknisk Museum/The Norwegian Museum of Science and Technology; Torhild Skåtun PhD candidate at School of Museum Studies, University of Leicester, UK and Dagny

Stuedahl, Professor at Oslo Metropolitan University. Both of us will be present at the workshops. We assume that each of you will bring in different perspectives and will play a significant role in generating knowledge. The project will strive to be useful and rewarding for all involved partners.

Thank you,

Torhild Skåtun

+47 95171220

Museumspeagog/PhD candidate, The School of Museum Studies
University of Leicester

Appendix 6:

Consent form for participants (young people, workshop leaders):

Consent form for participants

I agree to take part in the **Science, Identity and Belonging** study, which is research towards a PhD at School of Museum Studies at the University of Leicester.

I have had the research project explained to me and I have read the Information sheet about the project, which I may keep for my records.

I understand that this study will be carried out in accordance with the University of Leicester's Code of Research Ethics which can be viewed at <http://www2.le.ac.uk/institution/ethics/code>.

Material I provide as part of this study will be treated as confidential and securely stored in accordance with the General Data Protection Regulation 2018

I have read and I understand the information sheet	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I have been given the opportunity to ask questions about the project and they were answered to my satisfaction	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that the children in my care can withdraw from the study at any time before the 1st of December 2019.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I agree to my interviews and the workshops that I lead / participate in being photographed and filmed, and that my words and photos being used in a doctoral thesis.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I agree to my words and photos being used in related academic assignments and publications, including on the Internet.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that my personal details including my name will not be used in connection with any words that I have said or information I have passed on.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I give permission for me to be named in connection with any words that I have said or information I have passed on.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I request that my real name is acknowledged in any publications that reference the comments that I have made	Yes <input type="checkbox"/>	No <input type="checkbox"/>
I understand that all notes, audio, and video recordings will be destroyed securely at the finish of the PhD and will be done so at the Museum premises in Norway to comply with GDPR guidelines	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Name [PRINT]

Signature

Date

Appendix: 7

MELDESKJEMA

Meldeskjema (versjon 1.4) for forsknings- og studentprosjekt som medfører meldeplikt eller konsesjonsplikt (jf. personopplysningsloven og helseregisterloven med forskrifter).

1. Intro		
Samles det inn direkte personidentifiserende opplysninger?	Ja ● Nei ○	En person vil være direkte identifiserbar via navn, personnummer, eller andre personentydige kjennetegn. Les mer om hva personopplysninger .
Hvis ja, hvilke?	<input checked="" type="checkbox"/> Navn <input type="checkbox"/> 11-sifret fødselsnummer <input checked="" type="checkbox"/> Adresse <input checked="" type="checkbox"/> E-post <input checked="" type="checkbox"/> Telefonnummer <input checked="" type="checkbox"/> Annet	NB! Selv om opplysningene skal anonymiseres i oppgave/rapport, må det krysses av dersom det skal innhentes/registreres personidentifiserende opplysninger i forbindelse med prosjektet.
Annet, spesifiser hvilke	Kontonummer	
Skal direkte personidentifiserende opplysninger kobles til datamaterialet (koblingsnøkkel)?	Ja ○ Nei ●	Merk at meldeplikten utløses selv om du ikke får tilgang til koblingsnøkkel, slik fremgangsmåten ofte er når man benytter en databehandler
Samles det inn bakgrunnsopplysninger som kan identifisere enkeltpersoner (indirekte personidentifiserende opplysninger)?	Ja ○ Nei ●	En person vil være indirekte identifiserbar dersom det er mulig å identifisere vedkommende gjennom bakgrunnsopplysninger som for eksempel bostedskommune eller arbeidsplass/skole kombinert med opplysninger som alder, kjønn, yrke, diagnose, etc. NB! For at stemme skal regnes som personidentifiserende, må denne bli registrert i kombinasjon med andre opplysninger, slik at personer kan gjenkjennes.
Hvis ja, hvilke		
Skal det registreres personopplysninger (direkte/indirekte/via IP-/epost adresse, etc) ved hjelp av nettbaserte spørreskjema?	Ja ● Nei ○	Les mer om nettbaserte spørreskjema .
Blir det registrert personopplysninger på digitale bilde- eller videoopptak?	Ja ● Nei ○	Bilde/videoopptak av ansikter vil regnes som personidentifiserende.
Søkes det vurdering fra REK om hvorvidt prosjektet er omfattet av helseforskningsloven?	Ja ○ Nei ●	NB! Dersom REK (Regional Komité for medisinsk og helsefaglig forskningsetikk) har vurdert prosjektet som helseforskning, er det ikke nødvendig å sende inn meldeskjema til personvernombudet (NB! Gjelder ikke prosjekter som skal benytte data fra pseudonyme helseregistre). Dersom tilbakemelding fra REK ikke foreligger, anbefaler vi at du avventer videre utfylling til svar fra REK foreligger.

2. Prosjekttittel		
Prosjekttittel	Vitenskap, identitet og tilhørighet (VIT) - co-design av et læringsopplegg til en museumsutstilling	Oppgi prosjektets tittel. NB! Dette kan ikke være «Masteroppgave» eller liknende, navnet må beskrive prosjektets innhold.
3. Behandlingsansvarlig institusjon		
Institusjon Avdeling/Fakultet Institutt	Universitetet i Oslo Det matematisk-naturvitenskapelige fakultet Institutt for informatikk	Velg den institusjonen du er tilknyttet. Alle nivå må oppgis. Ved studentprosjekt er det studentens tilknytning som er avgjørende. Dersom institusjonen ikke finnes på listen, har den ikke avtale med NSD som personvernombud. Vennligst ta kontakt med institusjonen.
4. Daglig ansvarlig (forsker, veileder, stipendiat)		
Fornavn Etternavn Stilling Telefon Mobil E-post Alternativ e-post Arbeidssted Adresse (arb.) Postnr./sted (arb.sted)	Torhild Skåtun Museumspedagog 95171220 torhild.skatun@tekniskmuseum.no torhild.skatun@gmail.com Norsk Teknisk Museum Kjelsåsveien 143 0491 Oslo	Før opp navnet på den som har det daglige ansvaret for prosjektet. Veileder er vanligvis daglig ansvarlig ved studentprosjekt. Daglig ansvarlig og student må i utgangspunktet være tilknyttet samme institusjon. Dersom studenten har ekstern veileder, kanbiveileder eller fagansvarlig ved studiestedet stå som daglig ansvarlig. Arbeidssted må være tilknyttet behandlingsansvarlig institusjon, f.eks. underavdeling, institutt etc. NB! Det er viktig at du oppgir en e-postadresse som brukes aktivt. Vennligst gi oss beskjed dersom den endres.
5. Student (master, bachelor)		
Studentprosjekt	Ja ● Nei ○	Dersom det er flere studenter som samarbeider om et prosjekt, skal det velges en kontaktperson som føres opp her. Øvrige studenter kan føres opp under pkt 10.
Fornavn Etternavn Telefon Mobil E-post Alternativ e-post Privatadresse Postnr./sted (privatadr.) Type oppgave	Tobias Messenbrink 98439993 tobias.messenbrink@gmail.com tobias.messenbrink@tekniskmuseum.no Sognsveien 102f 0857 Oslo ● Masteroppgave ○ Bacheloroppgave ○ Semesteroppgave ○ Annet	
6. Formålet med prosjektet		

Formål	<p>Prosjektet er et samarbeidsprosjekt mellom PhD-student Torhild Skåtun ved Norsk Teknisk Museum/ University of Leicester, høyskolelektor Dagny Stuedahl ved HiOA og masterstudent Tobias Messenbrink ved UiO. Prosjektets formål er å bruke og forske på Participatory Design metoden ved å co-designe et opplegg tilknyttet utstillingen med arbeidstittel "blod, bein og DNA" som åpner sommeren 2018 ved Norsk Teknisk Museum. Vi rekrutterer en ungdomsgruppe som gjennom en rekke workshops skal være med å designe et interaktivt læringsopplegg og eventuelt en installasjon til utstillingen. Prosjektet avsluttes med evaluering av denne prosessen gjennom intervjuer/ spørreskjema.</p>	Redegjør kort for prosjektets formål, problemstilling, forskningsspørsmål e.l.
7. Hvilke personer skal det innhentes personopplysninger om (utvalg)?		
Kryss av for utvalg	<input type="checkbox"/> Barnehagebarn <input checked="" type="checkbox"/> Skoleelever <input type="checkbox"/> Pasienter <input type="checkbox"/> Brukere/klienter/kunder <input type="checkbox"/> Ansatte <input type="checkbox"/> Barnevernsbarn <input type="checkbox"/> Lærere <input type="checkbox"/> Helsepersonell <input type="checkbox"/> Asylsøkere <input type="checkbox"/> Andre	
Beskriv utvalg/deltakere	En gruppe ungdommer tilknyttet en fritidsklubb i Oslo.	Med utvalg menes dem som deltar i undersøkelsen eller dem det innhentes opplysninger om.
Rekruttering/trekking	Personlig rekruttert gjennom kontaktnettverk til Torhild Skåtun.	Beskriv hvordan utvalget trekkes eller rekrutteres og oppgi hvem som foretar den. Et utvalg kan trekkes fra registre som f.eks. Folkeregisteret, SSB-registre, pasientregistre, eller det kan rekrutteres gjennom f.eks. en bedrift, skole, idrettsmiljø eller eget nettverk.
Førstegangskontakt	Utvalget blir først kontaktet via e-post av Torhild Skåtun.	Beskriv hvordan kontakt med utvalget blir opprettet og av hvem. Les mer om dette på temasidene .
Alder på utvalget	<input checked="" type="checkbox"/> Barn (0-15 år) <input checked="" type="checkbox"/> Ungdom (16-17 år) <input checked="" type="checkbox"/> Voksne (over 18 år)	Les om forskning som involverer barn på våre nettsider.
Omtrentlig antall personer som inngår i utvalget	10	
Samles det inn sensitive personopplysninger?	Ja ● Nei ○	Les mer om sensitive opplysninger .
Hvis ja, hvilke?	<input checked="" type="checkbox"/> Rasemessig eller etnisk bakgrunn, eller politisk, filosofisk eller religiøs oppfatning <input type="checkbox"/> At en person har vært mistenkt, siktet, tiltalt eller dømt for en straffbar handling <input type="checkbox"/> Helseforhold <input type="checkbox"/> Seksuelle forhold <input type="checkbox"/> Medlemskap i fagforeninger	
Inkluderes det myndige personer med redusert eller manglende samtykkekompetanse?	Ja ○ Nei ●	Les mer om pasienter, brukere og personer med redusert eller manglende samtykkekompetanse .
Samles det inn personopplysninger om personer som selv ikke deltar (tredjepersoner)?	Ja ○ Nei ●	Med opplysninger om tredjeperson menes opplysninger som kan spores tilbake til personer som ikke inngår i utvalget. Eksempler på tredjeperson er kollega, elev, klient, familiemedlem.
8. Metode for innsamling av personopplysninger		

Kryss av for hvilke datainnsamlingsmetoder og datakilder som vil benyttes	<input checked="" type="checkbox"/> Papirbasert spørreskjema <input type="checkbox"/> Elektronisk spørreskjema <input checked="" type="checkbox"/> Personlig intervju <input checked="" type="checkbox"/> Gruppeintervju <input checked="" type="checkbox"/> Observasjon <input checked="" type="checkbox"/> Deltakende observasjon <input checked="" type="checkbox"/> Blogg/sosiale medier/internett <input type="checkbox"/> Psykologiske/pedagogiske tester <input type="checkbox"/> Medisinske undersøkelser/tester <input type="checkbox"/> Journaldata (medisinske journaler)	<p>Personopplysninger kan innhentes direkte fra den registrerte f.eks. gjennom spørreskjema, intervju, tester, og/eller ulike journaler (f.eks. elevmapper, NAV, PPT, sykehus) og/eller registre (f.eks. Statistisk sentralbyrå, sentrale helseregistre).</p> <p>NB! Dersom personopplysninger innhentes fra forskjellige personer (utvalg) og med forskjellige metoder, må dette spesifiseres i kommentar-boksen. Husk også å legge ved relevante vedlegg til alle utvalgs-gruppene og metodene som skal benyttes.</p> <p>Les mer om registerstudier her.</p> <p>Dersom du skal anvende registerdata, må variabelliste lastes opp under pkt. 15</p>
	<input type="checkbox"/> Registerdata	
	<input type="checkbox"/> Annen innsamlingsmetode	
Tilleggsopplysninger		
9. Informasjon og samtykke		
Oppgi hvordan utvalget/deltakerne informeres	<input checked="" type="checkbox"/> Skriftlig <input checked="" type="checkbox"/> Muntlig <input type="checkbox"/> Informeres ikke	<p>Dersom utvalget ikke skal informeres om behandlingen av personopplysninger må det begrunnes.</p> <p>Les mer her.</p> <p>Vennligst send inn mal for skriftlig eller muntlig informasjon til deltakerne sammen med meldeskjema.</p> <p>Last ned en veiledende mal her.</p> <p>NB! Vedlegg lastes opp til sist i meldeskjemaet, se punkt 15 Vedlegg.</p>
Samtykker utvalget til deltakelse?	<input checked="" type="radio"/> Ja <input type="radio"/> Nei <input type="radio"/> Flere utvalg, ikke samtykke fra alle	<p>For at et samtykke til deltakelse i forskning skal være gyldig, må det være frivillig, uttrykkelig og informert.</p> <p>Samtykke kan gis skriftlig, muntlig eller gjennom en aktiv handling. For eksempel vil et besvart spørreskjema være å regne som et aktivt samtykke.</p> <p>Dersom det ikke skal innhentes samtykke, må det begrunnes.</p>
Innhentes det samtykke fra foreldre for barn under 15 år?	Ja <input checked="" type="radio"/> Nei <input type="radio"/>	<p>Les mer om forskning som involverer barn og samtykke fra unge.</p>
Hvis nei, begrunn		
Innhentes det samtykke fra foreldre for ungdom mellom 16 og 17 år?	Ja <input type="radio"/> Nei <input checked="" type="radio"/>	<p>Les mer om forskning som involverer barn og samtykke fra unge.</p>
Hvis nei, begrunn	Vi regner med at det kommer frem sensitive personopplysninger om rase/ etnisitet og politiske meninger på grunn av prosjektets grunntema. Temaene vil bli diskutert i plenum i åpen dialog og vi vil påse at ingen vil føle seg presset til å gi ut sensitive opplysninger i diskusjonen. Vi mener derfor at ungdommen kan samtykke til dette selv.	
10. Informasjonssikkerhet		

Spesifiser	<p>Direkte personidentifiserende opplysninger brukes kun til å opprette kontakt, avtale møtetider og annen kommunikasjon og lagres ikke sammen med det øvrige datamateriale.</p> <p>Siden prosjektet er et samarbeidsprosjekt mellom tre forskere på tre ulike institusjoner og lagring på nettskytjenester ikke anses som sikkert nok planlegger vi å lagre datamateriale på krypterte harddisker, se beskrivelsen under.</p>	NB! Som hovedregel bør ikke direkte personidentifiserende opplysninger registreres sammen med det øvrige datamaterialet.
Hvordan registreres og oppbevares personopplysningene?	<input type="checkbox"/> På server i virksomhetens nettverk <input type="checkbox"/> Fysisk isolert PC tilhørende virksomheten (dvs. ingen tilknytning til andre datamaskiner eller nettverk, interne eller eksterne) <input type="checkbox"/> Datamaskin i nettverkssystem tilknyttet Internett tilhørende virksomheten <input type="checkbox"/> Privat datamaskin <input type="checkbox"/> Videoopptak/fotografi <input type="checkbox"/> Lydopptak <input type="checkbox"/> Notater/papir <input checked="" type="checkbox"/> Mobile lagringsenheter (bærbar datamaskin, minnepenn, minnekort, cd, ekstern harddisk, mobiltelefon) <input type="checkbox"/> Annen registreringsmetode	<p>Merk av for hvilke hjelpemidler som benyttes for registrering og analyse av opplysninger.</p> <p>Sett flere kryss dersom opplysningene registreres på flere måter.</p> <p>Med «virksomhet» menes her behandlingsansvarlig institusjon.</p> <p>NB! Som hovedregel bør data som inneholder personopplysninger lagres på behandlingsansvarlig sin forskningsserver.</p>
Annen registreringsmetode beskriv		Lagring på andre medier - som privat pc, mobiltelefon, minnepinne, server på annet arbeidssted - er mindre sikkert, og må derfor begrunnes. Slik lagring må avklares med behandlingsansvarlig institusjon, og personopplysningene bør krypteres.
Hvordan er datamaterialet beskyttet mot at uvedkommende får innsyn?	Data lagres på eksterne harddisker. Disse vil oppbevares i låsbart rom på Norsk Teknisk Museum, med fysisk tilgang kun for ansatte. Til arkivering låses de inn i arkivrom med adgang kun for administrasjonssjef. Diskene vil bli kryptert og krypteringsnøkkel vil kun bli gitt til prosjektansvarlig, student og ekstern forsker Dagny Stuedahl.	Er f.eks. datamaskintilgangen beskyttet med brukernavn og passord, står datamaskinen i et låsbart rom, og hvordan sikres bærbare enheter, utskrifter og opptak?
Samles opplysningene inn/behandles av en databehandler (ekstern aktør)?	Ja <input type="radio"/> Nei <input checked="" type="radio"/>	Dersom det benyttes eksterne til helt eller delvis å behandle personopplysninger, f.eks. Questback, transkriberingsassistent eller tolk, er dette å betrakte som en databehandler. Slike oppdrag må kontraktsreguleres.
Hvis ja, hvilken		
Overføres personopplysninger ved hjelp av e-post/Internett?	Ja <input type="radio"/> Nei <input checked="" type="radio"/>	F.eks. ved overføring av data til samarbeidspartner, databehandler mm.
Hvis ja, beskriv?		<p>Dersom personopplysninger skal sendes via internett, bør de krypteres tilstrekkelig.</p> <p>Vi anbefaler for ikke lagring av personopplysninger på nettskytjenester.</p> <p>Dersom nettskytjeneste benyttes, skal det inngås skriftlig databehandleravtale med leverandøren av tjenesten.</p>
Skal andre personer enn daglig ansvarlig/student ha tilgang til datamaterialet med personopplysninger?	Ja <input checked="" type="radio"/> Nei <input type="radio"/>	
Hvis ja, hvem (oppgi navn og arbeidssted)?	Dagny Stuedahl, Høgskolen i Oslo og Akershus	
Utleveres/deler personopplysninger med andre institusjoner eller land?	<input checked="" type="radio"/> Nei <input type="radio"/> Andre institusjoner <input type="radio"/> Institusjoner i andre land	F.eks. ved nasjonale samarbeidsprosjekter der personopplysninger utveksles eller ved internasjonale samarbeidsprosjekter der personopplysninger utveksles.

11. Vurdering/godkjenning fra andre instanser		
Søkes det om dispensasjon fra taushetsplikten for å få tilgang til data?	Ja <input type="radio"/> Nei <input checked="" type="radio"/>	For å få tilgang til taushetsbelagte opplysninger fra f.eks. NAV, PPT, sykehus, må det søkes om dispensasjon fra taushetsplikten. Dispensasjon søkes vanligvis fra aktuelt departement.
Hvis ja, hvilke		
Søkes det godkjenning fra andre instanser?	Ja <input type="radio"/> Nei <input checked="" type="radio"/>	F.eks. søke registreier om tilgang til data, en ledelse om tilgang til forskning i virksomhet, skole.
Hvis ja, hvilken		
12. Periode for behandling av personopplysninger		
Prosjektstart art Planlagt dato for prosjektslutt	21.03.2017 01.05.2019	Prosjektstart Vennligst oppgi tidspunktet for når kontakt med utvalget skal gjøres/datainnsamlingen starter. Prosjektslutt: Vennligst oppgi tidspunktet for når datamaterialet enten skal anonymiseres/slettes, eller arkiveres i påvente av oppfølgingsstudier eller annet.
Skal personopplysningene publiseres (direkte eller indirekte)?	<input type="checkbox"/> Ja, direkte (navn e.l.) <input type="checkbox"/> Ja, indirekte (bakgrunnsopplysninger) <input checked="" type="checkbox"/> Nei, publiseres anonymt	NB! Dersom personopplysninger skal publiseres, må det vanligvis innhentes eksplisitt samtykke til dette fra den enkelte, og deltakere bør gis anledning til å lese gjennom og godkjenne sitater.
Hva skal skje med datamaterialet ved prosjektslutt?	<input checked="" type="checkbox"/> Datamaterialet anonymiseres <input checked="" type="checkbox"/> Datamaterialet oppbevares med personidentifikasjon	NB! Her menes datamaterialet, ikke publikasjon. Selv om data publiseres med personidentifikasjon skal som regel øvrig data anonymiseres. Med anonymisering menes at datamaterialet bearbeides slik at det ikke lenger er mulig å føre opplysningene tilbake til enkeltpersoner. Les mer om anonymisering.
Planlagt dato for avsluttet behandling av personopplysninger:	31.12.2020	NB! Merk at "Planlagt dato for avsluttet behandling av personopplysninger" må være senere enn "Planlagt dato for prosjektslutt" over.
Oppgi hvorfor	<input checked="" type="checkbox"/> Oppbevares for oppfølgingsstudier/videre forskning <input type="checkbox"/> Oppbevares for undervisningsformål <input type="checkbox"/> Annet	Hovedregelen for videre oppbevaring av data med personidentifikasjon er samtykke fra den registrerte. Årsaker til oppbevaring kan være planlagte oppfølgingsstudier, undervisningsformål eller annet. Datamaterialet kan oppbevares ved egen institusjon, offentlig arkiv eller annet. Les om arkivering hos NSD.
Annet, beskriv		
Hvor skal datamaterialet oppbevares?	Hos Norsk Teknisk Museum.	
13. Finansiering		
Hvordan finansieres prosjektet?		
14. Tilleggsopplysninger		
Tilleggsopplysninger		

DISCLOSURE

Reporting form (version 1.4) for research and student projects that involve reporting or licensing (cf. the Personal Data Act and the Health Register Act with regulations).

1. Intro		
Is direct personally identifiable information collected?	Yes ● No ○	A person will be directly identifiable by name, social security number, or other unique characteristics.
If so, which ones?	<input checked="" type="checkbox"/> Name <input type="checkbox"/> 11-digit birth number <input checked="" type="checkbox"/> Address <input checked="" type="checkbox"/> Email <input checked="" type="checkbox"/> Phone number <input checked="" type="checkbox"/> Other	<p>Read more about what personal information .</p> <p>NB! Although the information should be anonymized in assignment / report, it must be ticked off if it is to be obtained / registered person-identifying</p> <p>information related to the project.</p>
Other, specify which	Account number	
Shall direct personally identifiable information be linked to the data material (link key)?	Yes ○ No ●	<p>Please note that the notification is released even if you cannot access it</p> <p>to the Link Key, as is often the case when one using a data processor</p>
Is background information collected that can identify individuals (indirect person-identifying information)?	Yes ○ No ●	<p>A person will be</p> <p>indirectly be identifiable</p> <p>if it is possible to identify</p> <p>the person through background information such as residential municipality or workplace / school combined with information such as age, gender, occupation, diagnosis, etc.</p>
If so, which ones		<p>NB! If a statement is to be counted as person-identifying, it must be</p>

		registered in combination with other information, so that people can be recognized
Shall personal information be recorded (directly / indirectly / via IP / email address, etc) using online questionnaires?	Yes ● No ○	Read more about online questionnaires .
Will personal data be recorded on digital images or video?	Yes ● No ○	Image / video recording of faces will be considered personally identifiable.
Is REK seeking an assessment of whether the project is covered by the Health Research Act?	Yes ○ No ●	<p>NB! If the REK (Regional Committee for Medical and health research ethics) has rated the project as health research, there is no need to submit message form to the Privacy Ombudsman (NB! Does not apply to projects that use data from pseudonyms health records).</p> <p>If feedback from REK is not available, we recommend that you await further filling out the form until answers from REK is available.</p>
2. Project title		
Project title	Science, identity and affiliation (VIT) - co-design of a learning program for a museum exhibition	Please enter the project title. NB! This cannot be "Master's thesis" or similar, the name must describe the content of the project.
3. The institution responsible for treatment		
Institutions	University of Oslo	Choose the institution you are affiliated with. All levels must be specified. In the case of a student project, it is the student's affiliation that is crucial. If the institution is not listed, it does not deal with NSD as Data
Department / Faculty	The Faculty of Mathematics and Natural Sciences	

Institute	Department of Informatics	Protection Officer. Please contact institution.
4. Daily responsible (researcher, supervisor, fellow)		
first name	Torhild	<p>List the name of the person in charge of the project daily. The supervisor is usually responsible on a daily basis for a student project.</p> <p>The day-to-day manager and student must basically be affiliated with the same institution.</p> <p>If the student has an external supervisor, can the second supervisor or subject manager at the place of study stand as daily responsible.</p> <p>Workplace must be associated with the controller institution, e.g. subdivision, institute etc.</p> <p>NB! It is important that you enter an email address as used actively. Please let us know if it change.</p>
Surname	Skaatun	
Score	Museum Educator	
Telephone		
Mobile	+47 95171220	
E-mail	torhild.skaton@tekniskmuseum.no	
Alternate email	torhild.skaton@gmail.com	
Workplace	Norwegian Museum of Science and Technology	
Address (work)	Kjelsåsveien 143	
5. Student (Master, Bachelor)		
student Project	Yes ● No ○	<p>If there are several students working together on one the project, a contact person must be selected who will be listed here. Other students can be listed under item 10.</p>
first name	Tobias	
Surname	Messenbrink	
Telephone	+ 4798439993	

Mobile		
E-mail	tobias.messenbrink@gmail.com	
Alternate email	tobias.messenbrink@tekniskmuseum.no	
private Address	Sognsveien 102f	
Postal code / place (private address)	0857 Oslo	
Type of assignment	<ul style="list-style-type: none"> ● Master's thesis ○ Bachelor thesis ○ Semester assignment ○ Other 	
6. The purpose of the project		
purpose	<p>The project is a collaborative project between a PhD student Torhild Skåtun at the Norwegian Museum of Science and Technology/ University of Leicester, Assistant professor Dagny Stuedahl at HiOA, and master's student Tobias Messenbrink at UiO.</p> <p>The purpose of the project is to use and research on the Participatory Design method, by co-designing a learning program connected to the exhibition, with the working title, "Blood, Bones and DNA" that will open in summer 2018 at the Norwegian Museum of Science and Technology.</p> <p>We will recruit a youth group, that through a number of workshops will help design an interactive learning program and possibly another installation in the exhibition. The project ends with an evaluation of this process through interviews / questionnaires.</p>	Briefly describe the project's purpose, problem, research questions or the like.
7. Which persons should personal data be collected on (selection)?		

Check the selection	<input type="checkbox"/> Kindergarten child <input checked="" type="checkbox"/> School students <input type="checkbox"/> Patients <input type="checkbox"/> Users / clients / customers <input type="checkbox"/> Employees <input type="checkbox"/> Child protection children <input type="checkbox"/> Teachers <input type="checkbox"/> Health professionals <input type="checkbox"/> Asylum seekers <input type="checkbox"/> Others	
Describe the selection / participants	A group of young people affiliated with a leisure club in Oslo.	By sample is meant those who
		participate in the survey or those for which information is obtained.
Recruitment / trekking	Personally recruited through Torhild Skaatun's contact network.	Describe how the sample is drawn or recruited and state who is doing it. A selection can be drawn from registers such as e.g. The National Register, Statistics Norway, patient records, or it can be recruited through eg. a business, school, sports environment or own network.
First Contact	The young people will first be contacted by email by Torhild Skåtun.	Describe how contact with the committee is established and of whom.
Age of sample	<input checked="" type="checkbox"/> Children (0-15 years) <input checked="" type="checkbox"/> Youth (16-17 years) <input checked="" type="checkbox"/> Adults (over 18)	Read more about this on the theme pages . Read about research involving children on our website.
Approximate number of people which is part of the selection	10	
Is sensitive personal information collected?	Yes ● No ○	Read more about sensitive information .

If so, which ones?	<ul style="list-style-type: none"> ■ Racial or ethnic background, or political, philosophical or religious beliefs □ That a person has been suspected, charged, prosecuted or convicted for a criminal offense □ Health conditions □ Sexual relationships □ Membership in trade unions 	
Does it include persons of legal age with reduced or missing competence to give informed consent?	Yes ○ No ●	Read more about patients, users and people reduced or lack of consent .
Is personal data on people who do not even participate (Third parties) collected?	Yes ○ No ●	Third-party information means information, which can be traced back, to non-members of the selected people. Examples of third parties include a colleague, a student, client, family member.
8. Method of collecting personal data		

<p>Make a cross on data collection methods and data sources that will be used</p>	<ul style="list-style-type: none"> ■ Paper-based questionnaire <input type="checkbox"/> Electronic Questionnaire ■ Personal interview ■ Group interview ■ Observation ■ Participatory observation ■ Blog / social media / internet <input type="checkbox"/> Psychological / educational tests <input type="checkbox"/> Medical examinations / tests <input type="checkbox"/> Journal data (medical records) <input type="checkbox"/> Register data <input type="checkbox"/> Other collection method 	<p>Personal information can be obtained directly from it registered e.g. through questionnaires, interviews, tests, and / or various journals (e.g. student folders, New Work and Welfare (NAV), Pedagogical- Psychological Service (PPT), hospitals) and / or registries (eg Statistics Norway, central health records).</p> <p>NB! If personal information is obtained from different people (selection) and with different methods, this must be specified in comment box. Also, remember to attach relevant ones appendices to all sample groups and methods to be used. Read more about registry studies here.</p> <p>If you are going to use registry data, variable list must uploaded under item 15</p>
<p>Additional information</p>		
<p>9. Information and consent</p>		
<p>State how the committee / participants are informed</p>	<ul style="list-style-type: none"> ■ Written ■ Orally <input type="checkbox"/> Not informed 	<p>If the committee is not to be informed about the treatment it must be justified by personal data. Read more here.</p> <p>Please submit template for written or oral information to the participants along with the notification form.</p> <p>Download a guide template here. NB! Attachments are uploaded at the end of the message form, see Item 15 Appendix.</p>

Do the selected persons agree to participate?	<ul style="list-style-type: none"> ● Yes ○ No. ○ Multiple selections, not everyone's consent 	<p>For a research consent be valid, the participation must be voluntary, explicit and informed .</p> <p>Consent can be given in writing, orally or through one active action. For example, one will an answer to a questionnaire be considered as active consent.</p> <p>If consent is not to be obtained, it must justified.</p>
Will consent be obtained from parents for children under 15?	Yes ● No ○	Read more about research involving children and consent of young people .
If no, justify		
Will consent be obtained from parents of youth between 16 and 17 years?	Yes ○ No ●	Read more about research involving children and consent of young people .
If no, justify	We expect that sensitive and personal information about race / ethnicity and political opinions will surface, on the basis of the project's main theme. The themes will be discussed in a plenary and open dialogue. We will ensure that no one will feel pressured to release sensitive information in the discussions. We therefore believe that the youth can consent	
	to this themselves.	
10. Information security		

Specify	<p>Direct personal identifying information will only be used to set up contact, schedule meeting times and other communications and is not stored with the rest of the research data.</p> <p>Since the project is a collaborative project between three researchers at three different institutions and storage on cloud services is not considered secure enough, we plan to save data material on encrypted hard drives, see description below.</p>	NB! As a rule, should not direct personal identifiable information be recorded together with the other data material.
How to register and keep personal information?	<ul style="list-style-type: none"> <input type="checkbox"/> On a server in the corporate network <input type="checkbox"/> Physically isolated PC belonging to the business (ie none connection to other computers or networks, internal or external) <input type="checkbox"/> Computer in a network system connected to the Internet related business <input type="checkbox"/> Private computer <input type="checkbox"/> Video / photography <input type="checkbox"/> Sound recording <input type="checkbox"/> Notes / paper <input checked="" type="checkbox"/> Mobile storage devices (laptop, pen, memory card, cd, external hard drive, mobile phone) <input type="checkbox"/> Other registration method 	<p>Check which aids are used for registration and analysis of information.</p> <p>Tick several if the bullet points if the data is recorded in several ways.</p> <p>By "business" is here meant the person responsible for treatment institution.</p> <p>NB! As a general rule, should contain data personal data is stored on its controller research server.</p>
Other registration method describe		Storage on other media - like private PC, mobile phone, memory stick, server at another work site - is smaller certainly, and must therefore be justified. Such storage must clarified with the institution responsible for treatment, and personal data should be encrypted.
How is the data material protected from unauthorized access?	Data is stored on external hard drives. These will be stored in a lockable room at the Norwegian Museum of Science and Technology, with physical access	For example, computer access protected with username and password. Is the computer stored
	<p>only for employees. For archiving, it is locked in the archive room with access only for the Administration Manager.</p> <p>The disks will be encrypted and the encryption key will only be given to the project manager, student and the external researcher Dagny Stuedahl.</p>	in a locked room, and how to secure portable devices, prints and admission?

Is information collected / processed by a data processor (external prosecutor)?	Yes <input type="radio"/> No <input checked="" type="radio"/>	If it is used external to fully or partially process personal data, e.g. QuestBack, a transcription assistant or interpreter, this is to be considered as a data processor. Such missions must contract governed.
If so, which one		
Transferring personal data using email / internet?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Eg. when transferring data to a partner, data processor etc. If personal data is to be sent via the Internet, they should be sufficiently encrypted. We recommend not storing personal data on cloud services. If cloud service is used, it must be entered into written data processing agreement with the supplier of service.
If so, describe?		
Must people other than the daily responsible / student have access to the data material with personal information?	Yes <input checked="" type="radio"/> No <input type="radio"/>	
If so, who (enter name and workplace)?	Dagny Stuedahl, Oslo University College and Akershus	
Disclosed / shared personal data with other institutions or countries?	<input checked="" type="radio"/> No. <input type="radio"/> Other institutions <input type="radio"/> Institutions in other countries	Eg. at national collaborative projects were personal information is exchanged or at international collaborative projects where personal data
		exchanged.
11. Assessment / approval of other bodies		
Is the application made for an exemption from the duty of confidentiality to obtain access to data?	Yes <input type="radio"/> No <input checked="" type="radio"/>	To access confidential information from eg. NAV, PPT, hospital, it must be applied for exemption from the duty of confidentiality. Exemption is sought usually from the relevant ministry.

If so, which ones		
Approval is sought from other agencies?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Eg. seek register owner for access to data, a management about access to research in business, school.
If so, which one		
12. Period for processing personal data		
Project Start	03/21/2017	Project start. Please indicate the time of contact with the sample to be done / data collection starts.
Scheduled date for project end	01/05/2019	End of project: Please indicate when the data material is either to be anonymized / deleted, or filed pending follow-up studies or otherwise.
Need personal information published (direct or indirectly)?	<input type="checkbox"/> Yes, direct (name, etc.) <input type="checkbox"/> Yes, indirect (background information) <input checked="" type="checkbox"/> No, published anonymously	NB! If personal data is to be published, an explicit consent is necessary. This is usually obtained from each individual, and participants should be given the opportunity to read review and approve quotes.
What is going to happen to the data material by project end?	<input checked="" type="checkbox"/> The data is anonymized <input checked="" type="checkbox"/> The data is stored with personal identification	NB! Here means the data material, not the publication. Though the data is published with personal

Postcode / location (work location)	0491 Oslo	
		<p>identification it shall usually anonymized. With anonymization it means that the data material is processed so that it is no longer possible to pass the information back to individuals.</p> <p>Read more about anonymization .</p>
Planned date of completion treatment of Privacy policy:	31.12.2020	NB! Note that "Scheduled Completion Date of personal information "must be later than" Scheduled project end date" above.
State why	<p>■ Store for follow-up studies / further research</p> <p><input type="checkbox"/> Store for educational purposes</p> <p><input type="checkbox"/> Other</p>	<p>The main rule for further data retention with personal identification is the consent of the data subject.</p> <p>Reasons for retention may be planned follow-up studies, teaching purposes or other.</p> <p>The data material can be stored at your own institution, public archive or other.</p>
Other, describe		
Where is the data material stored?	At the Norwegian Museum of Science and Technology	Read about NSD filing.
13. Financing		
How to finance project?		
14. Additional information		
Additional information		

Appendix 8:



Jo Herstad

Institutt for informatikk
Universitetet i Oslo Postboks
1080 Blindern
0316 OSLO

Vår dato: 24.05.2017 Vår ref: 53836 / 3 / AGL Deres dato: Deres ref:
TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 23.03.2017. All nødvendig informasjon om prosjektet forelå i sin helhet 21.05.2017. Meldingen gjelder prosjektet:

53836	<i>Vitenskap, identitet og tilhørighet (VIT) - co-design av et læringsopplegg til en museumsutstilling</i>
<i>Behandlingsansvarlig</i>	<i>Universitetet i Oslo, ved</i>
<i>institusjonens øverste leder</i>	<i>Daglig ansvarlig Jo Herstad</i>
<i>Student</i>	<i>Tobias Messenbrink</i>

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering.

Endringsmeldinger gis via et eget skjema,

http://www.nsd.uib.no/personvernombud/meld_prosjekt/meld_endringer.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://pvo.nsd.no/prosjekt>.

Personvernombudet vil ved prosjektets avslutning, 01.05.2019, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

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Kontaktperson: Audun Løvlie tlf: 55 58 23 07

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

NSD – Norsk senter for forskningsdata AS	Harald Hårfagres gate 29	Tel: +47-55 58 21 17	nsd@nsd.no	Org.nr. 985 321 884
NSD – Norwegian Centre for Research Data	NO-5007 Bergen, NORWAY	Faks: +47-55 58 96 50	www.nsd.no	

Vedlegg: Prosjektvurdering

Kopi: Tobias Messenbrink tobias.messenbrink@gmail.com

Personvernombudet for forskning

Prosjektvurdering - Kommentar



Prosjektnr: 53836

Prosjektet er et samarbeidsstudie. Universitetet i Oslo er behandlingsansvarlig institusjon for den delen som inngår i mastergraden til studenten. Personvernombudet forutsetter at ansvaret for behandlingen av personopplysninger er avklart mellom institusjonene. Vi anbefaler at det inngås en avtale som omfatter ansvarsfordeling, ansvarsstruktur, hvem som initierer prosjektet, bruk av data og eventuelt eierskap.

Prosjektets formål er å bruke og forske på Participatory Design metoden ved å co-designe et opplegg tilknyttet utstillingen med arbeidstittel "blod, bein og DNA" som åpner sommeren 2018 ved Norsk Teknisk Museum.

Utvalget informeres skriftlig og muntlig om prosjektet og samtykker til deltakelse. Informasjonsskrivet er godt utformet.

Det behandles sensitive personopplysninger om etnisk bakgrunn eller politisk/filosofisk/religiøs oppfatning.

Personvernombudet legger til grunn at student etterfølger Universitetet i Oslo sine interne rutiner for datasikkerhet. Dersom personopplysninger skal lagres på mobile enheter, bør opplysningene krypteres tilstrekkelig.

Norsk Teknisk Museum er databehandler for prosjektet. Universitetet i Oslo skal inngå skriftlig avtale med Norsk Teknisk Museum om hvordan personopplysninger skal behandles, jf. personopplysningsloven § 15. For råd om hva databehandleravtalen bør inneholde, se Datatilsynets veileder: <http://www.datatilsynet.no/Sikkerhet-internkontroll/Databehandleravtale/>.

Forventet prosjektslutt er 01.05.2019. Ifølge prosjektmeldingen skal innsamlede opplysninger da oppbevares med personidentifikasjon til 31.12.2020 for

oppfølgingsstudier/videre forskning, innen denne datoen skal datamateriale anonymiseres. For at datamaterialet skal være anonymt må navn (på samtykkeerklæringer og koblingsnøkkel) slettes. I tillegg må indirekte personidentifiserende opplysninger (bakgrunnsopplysninger) slettes eller grovkategoriseres/omskrives, slik at ingen enkeltpersoner kan gjenkjennes. Lydopptak og videoopptak skal slettes.

Translated by Torhild Skåtun, with help from the Norwegian Center for Research
Jo Herstad

Institute for Informatics University of
Oslo Postboks 1080 Blindern
0316 Oslo

Response on a note on how to treat personal information

We referred to notification on treatment of personal information, reserved 23.03.2017. All necessary information about the project existed in its entirety 21.05.2017. The notification is about the project:

53836Science, identity and belonging – co- design of a learning activity in a museum exhibition.

Controller:University of Oslo, by the institutions upper management

Daily responsible:Jo Herstad

Student:Tobias Messenbrink

The data protection official has considered the project, and find that the treatment of the personal information will be regulated by § 7-27 in the law of regulation of personal information. The data protection official recommend that the project can be carried out.

The data protection official will recommend that the project is conducted as described in the notification form, in correspondence with the data protection official the law of person information and health registrar law with its regulations. The treatment of the person data act can be set forward.

If your project changes it may be necessary to send in a change request form. An application on changes can be sent by a

form: http://www.nsd.uib.no/personvernombud/meld_prosjekt/meld_endringer.html. It shall also be given a notification if the project continues after three years.

The data protection official has listed the information about this project in a public database <http://pvo.nsd.no/prosjekt>.

The data protection official will by the project's completion, 01.05.2019: correct an inquiry regarding the status of the treatment of the privacy information.

Sincerely

Kjersti Haugstvedt Audun Løvlie

Contact person: Audun Løvlie phone +47 55 58 23 07

Monday, April 30, 2018

Translated by Torhild Skåtun, with help from the Norwegian Center for Research
Jo Herstad
Intitute for Informatics University of Oslo
Postboks 1080 Blindern
0316 Oslo

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inquiry regarding the status of the treatment of the privacy information.

Sincerely

Kjersti Haugstvedt

Audun Løvlie

Contact person: Audun Løvlie phone +47 55 58 23 07



Appendix: 9

University Ethics Sub-Committee for Science and Engineering
and Arts Humanities

07/02/2020

Ethics Reference: 16091-ts298-ss/ms:museums&galleries

TO:

Name of Researcher Applicant: Torhild Skatun

Department: Museum Studies

Research Project Title: Science, identity and belonging

Dear Torhild Skatun,

RE: Ethics review of Research Study application

The University Ethics Sub-Committee for Science and Engineering and Arts Humanities has reviewed and discussed the above application.

1. Ethical opinion

The Sub-Committee grants ethical approval to the above research project on the basis described in the application form and supporting documentation, subject to the conditions specified below.

2. Summary of ethics review discussion

The Committee noted the following issues:

This application has now been given full ethical approval. You should retain a copy of this letter and submit it with your PhD thesis in due course. We wish you all the best with the write-up of your fieldwork, Dr Elizabeth T Hurren, Chair of the Committee

3. General conditions of the ethical approval

The ethics approval is subject to the following general conditions being met prior to the start of the project:

As the Principal Investigator, you are expected to deliver the research project in accordance with the University's policies and procedures, which includes the University's Research Code of Conduct and the University's Research Ethics Policy.

If relevant, management permission or approval (gate keeper role) must be obtained from host organisation prior to the start of the study at the site concerned.

4. Reporting requirements after ethical approval

You are expected to notify the Sub-Committee about:

- Significant amendments to the project
- Serious breaches of the protocol
- Annual progress reports
- Notifying the end of the study

5. Use of application information

Details from your ethics application will be stored on the University Ethics Online System. With your permission, the Sub-Committee may wish to use parts of the application in an anonymised format for training or sharing best practice. Please let me know if you do not want the application details to be used in this manner.

Best wishes for the success of this research project.

Yours sincerely,

Dr. Elizabeth Hurren
Chair

Appendix 10:

APPENDIX 10
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Appendix 11:

Workshop 1 - Introduction to Science, identity and belonging (21.03.2017)

TORHILD, 21.03.2017:

Ni deltagere fra Groruddalen ungdomsråd kom på første økt med medvirkning etter museets åpningstider kl. 1700. De kom til litt ulike tidspunkt, en kvart på og de siste kom halv 6. Da hadde de gått feil. Ungdomsrådet treffes hver tirsdag og har selv utført en undersøkelse av hva 1200 elever ønsker for å bedre livskvaliteten i Groruddalen. I rådet representerer de sin skole (elevrådsledere), ungdomsklubber og politiske organisasjoner som AUF.

Dette notatet ble først skrevet fire-fem arbeidsdager etter endt workshop, da det var rett videre i utstillings utviklings workshop. En del av den to dagers samlingen var blant annet å arrangere et åpent møte i auditorium 13. Der det ble avholdt medisinske forelesninger tidlig.

Det kom tre jenter og seks gutter på selve medproduksjons verkstedet. Vi startet med å spise pizza, mrrk. at det gikk mye av vegetarpizza. Det viste seg at de ikke var en sammensveiset gruppe og at noen kjente hverandre bedre enn andre. En jente sa hun nettopp hadde flyttet fra Ammerud til Stovner og at hun kjente til flere fra klassen som deltok på Teknisk museums talentprogram.

Ennå er det usikkert hvor prosessen leder, blir det en installasjons i utstillingen laget av ungdom, en læringssituasjon eller et læringsopplegg på mobiltelefon eller Ipad? – Videre vil det være interessant å se på flyt av informasjon, oppfatninger og kunnskaper mellom gruppen av ungdom, kuratoren, forskeren, teknikeren og pedagogen. Er det elementer i deres oppfatninger som får innvirkninger på utstillingstvikling. Gjennom filming, loggføring vil vi holde et sterkt fokus på selve prosessen.

Etter å ha spist pizza flyttet vi oss til LAB, der Ageliki presenterte LAB som en eksperimentell sone for utforskning av museumsobjekter i en utstrakt betydning. TODT ble vist fram som en ferdig utstilling. Vi fortsatte å snakke oss videre inn i tema for utstillingen og fokuserte på de tre begrepene identitet, tilhørighet og etnisitet. Fra den første innledende samtalen ble spørsmålet «hvor kommer du fra» som voksne mennesker ofte stilte, og at det i de lå et implisitt «egentlig» bak. Og at i det egentlige var underteksten at du kommer ikke herfra. Mye av refleksjonen spant rundt valget i hvem man var når og i hvilke situasjoner.

Generelt opplevdes ungdommen som veldig reflekterte og med klare formeninger om betydningen av de ulike begrepene.

Etter gjennomgang rundt bordet delte vi en papirrull opp i forskjellige felt: Etnisitet, identitet og tilhørighet. Der vi alle sammen noterte ned stikkord under hver kategori. En oppgave ungdommen startet med en gang. På forhånd hadde vi en ide om at det kunne være vanskelig og at en måte å overkomme dette på var ved å stille seg selv i mest mulig likeverdig situasjon. Notere samtidig med de unge viste seg ikke å være nødvendig.

Vi har tenkt å jobbe fram et læringsprogram som tar i bruk lyd og ønsket å introdusere elevene for dette mediet. Fikk inntrykk av at de ikke synes det var en strålende tanke og vi diskuterte litt fram og tilbake.

Workshop 1 - Introduction to Science, identity and belonging (21.03.2017)

TORHILD, 21/03/2017:

Nine participants from the Groruddalen youth council came to the first session of co-design workshop after the museum's opening hours at 5 pm. They arrived at slightly different times, one 4,40 pm am the last ones arrived at half past six. They had gone the wrong way. The youth council meets every Tuesday and has itself carried out a survey of what 1,200 pupils want to improve the quality of life in Groruddalen. In the council, they represent their school (student council leaders), youth clubs and political organizations such as AUF (The Norwegian Labor party youth organization).

This research log was first written four or five working days after the end of the workshop, as it was straight ahead in workshops developing the exhibition concept. Part of the two-day gathering included arranging a public meeting in the auditorium at the old university downtown Oslo, where medical lectures were held early on.

There were three girls and six boys at the co-production workshop itself. We started by eating pizza, noticing that the vegetarian pizza. It turned out that they were not a close-knit group, and that some knew each other better than others. One girl said she had just moved from Ammerud to Stovner and that she knew several people from the class who participated in the Technical Museum's talent programme.

It is still uncertain where the process will lead, will there be an installation in the exhibition made by young people, a learning situation or a learning program on a mobile phone or iPad? - Furthermore, it will be interesting to look at the flow of information, perceptions and knowledge between the group of young people, the curator, the researcher, the technician and the pedagogue. Are there elements in their perceptions that have an impact on exhibition development. Through filming and logging, we will keep a strong focus on the process itself.

After eating pizza, we moved to the LAB, where Ageliki presented the LAB as an experimental zone for the exploration of museum objects in an extended understanding. The TODT (Grossraum – organisation for Todt and forces labor during the second world war in Norway) was presented as a finished exhibition. We continued to talk our way into the theme of the exhibition and focused on the three concepts of identity, belonging and ethnicity. From the first initial conversation, the question "where are you from" that adults often ask, and that in them lay an implicit "really" behind. And that in reality the subtext was that you don't come from here. Much of the reflection revolved around the choice of who one was when, and in which situations.

In general, the young people were experienced as very reflective and with clear ideas about the meaning of the various terms.

After review around the table, we divided a roll of paper into different fields: Ethnicity, identity and belonging. Where we all jotted down keywords under each category. A task the youth started right away. In advance, we had an idea that it could be difficult and that one way to overcome this was to put ourselves in the most equal situation possible. Taking notes at the same time as the young people proved not to be necessary.

We intend to develop a learning program that uses sound and wanted to introduce the students to this medium. I got the impression that they didn't think it was a brilliant idea and we discussed a bit back and forth.

(my translation, Torhild Skåtun)

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