

CO-DESIGNING TECHNOLOGICAL EXPLORATIONS IN DEVELOPING FUTURES LITERACY THROUGH SPECULATIVE DESIGN AND AN ARTISTIC INTERVENTION

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ABSTRACT

Futures Literacy is the capability to imagine and understand potential futures to prepare ourselves to act and innovate in the present. This pilot study aims to understand how artistic methodologies and speculative design can support the collaborative exploration of futures in the context of work and contribute to developing peoples' capability of futures literacy. Our premise is that technologies such as Artificial Intelligence and the Internet of things can augment people and support their needs at work. To illustrate this process, we have presented a collaborative method that integrates an artistic intervention with speculative design activities. We tested the method in a full-day workshop with seventeen (17) participants from a Swedish academy responsible for enabling learning and competence development at work in the healthcare sector. The results indicate that the artistic intervention, combined with the speculative design activities, can challenge current participants' perspectives and offer them new ways of seeing futures with technologies. These new ways of seeing reveal underlying premises crucial in developing the capability of futures literacy.

Keywords: Collaborative design, Case study, Design methods, Futures Literacy

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1 INTRODUCTION

New information technology like the Internet of Things (IoT) and Artificial Intelligence (AI) present promising (and concerning) capabilities that can transform and bring innovation into the future of work (Wang and Siau, 2019), specifically in organisations of the educational and healthcare sector (World Economic Forum, 2020). AI has developed dramatically over the last decades, and such developments “will have a transformational impact” on organisations (Nortje and Grobbelaar, 2020); however, most of these opportunities are yet to be exploited due to the level of readiness in the organisations (Nortje and Grobbelaar, 2020). This rapid development also leads people to new concerns as technology develops faster than people can understand and be ready for it. Consequently, transformational changes in education, organisations and people’s re-skilling are needed to deal with the developments (Koski and Husso, 2018). Unfortunately, research on AI adoption is in its infancy (Jöhnk et al., 2020), and there is a lack of a common perspective in the literature (Hamm and Klesel, 2021). However, recent literature presents models and frameworks that underscore various dimensions like culture to determine the AI readiness of organisations (Jöhnk et al., 2020; Nortje and Grobbelaar, 2020). These dimensions resonate with Ericsson’s report (2020), concluding that adopting AI in organisations relies heavily on cultural dimensions and people. Some aspects that affect these dimensions include fears of losing jobs when technologies take over, lack of knowledge and understanding of technology, openness to change, losing control of technology and the preference to continue current ways of working (Ericsson, 2020).

On the one hand, to deal with the uncertainties and complexities that new futures will bring with the integration of novel technologies, the discipline of futures literacy can help to imagine, navigate and use those futures to influence the present (Miller, 2018). Futures literacy can be defined as the ability to imagine futures and use those futures to prepare and innovate in our current challenges (Boer et al., 2018), questioning what AI and education are, and exploring the relationship between the two (Miller and Tuomi, 2022). On the other hand, traditional collaborative design methods aim to involve diverse stakeholders in design activities (Brandt et al., 2012) with a human-centred approach (Mattelmäki et al., 2011). These activities can be augmented with artistic methods and speculative design (Bozic-Yams and Aranda-Muñoz, 2021; Elsdén et al., 2017), which can help introduce technology to people and engage them in the “inquiry of technological potentialities in the future of work” (Bozic-Yams and Aranda-Muñoz, 2021). In this context, the future of work is understood as how people will work, attending to influential factors related to society and technology (Gartner, 2022).

We see design as a reflective dialogue with materials where notions of generative metaphors and ways of seeing (Schön, 1993) can help design practitioners frame design situations and collaborative activities. We hypothesise that these alternative ways of framing and seeing, in combination with artistic methods, can contribute to building futures literacy capabilities and help people to ideate and explore futures where technology supports them in their work. To address this hypothesis, we present the following research question that guided this paper: How can speculative design and artistic methods contribute to exploring human-centric technologies in the context of futures literacy skills development?

To answer this research question, we developed a collaborative method that included an artistic intervention to shift the perspective of what technology can do for people, a technological presentation that included demonstrators to expand the participants’ view on potential technologies that can disrupt the education and healthcare sector, and a combination of collaborative design activities with speculative design to support the exploration of the workshop’s goal. We deviated from predominant organisational views that attend to adopt and integrate new technologies to increase productivity (Ericsson, 2020) and instead took a designerly and artistic perspective that introduced a more critical and ethical view of using technology to enable learning at work to augment workers and end users’ skills and improve the experience for both worker and user.

We conducted a pilot study in collaboration with a Swedish municipality to test this method. We chose a municipality because, in our experience, the public sector has been slow to incorporate new technologies into its workplace. This partnership will allow us to analyse various professional domains over the coming years. However, for the pilot study, we specifically examined the municipality’s internal academy, which serves as a professional learning and skill development platform among regional employees who are mainly healthcare practitioners. The workshop’s goal was to collaboratively “explore how new technologies can strengthen the organisation as enablers of future skills development”. We tested our method in a full-day workshop with seventeen (17) participants,

where we collected reflections from all the participants and other empirical material to analyse how speculative design and the artistic intervention played a role in such exploration, attending to the six key constructs of empathy, critical thinking, the personal need for structure, creativity, open-mindedness and self-efficacy (Boer et al., 2018) that can be considered as a way to measure futures literacy.

2 THEORETICAL PERSPECTIVE AND RELATED WORK

We understand design as a reflective dialogue with materials, where the materials “talk back” to the designer (Schön, 1992). This theoretical perspective considers metaphors to generate new ways of seeing and understanding design situations (Schön, 1993). Metaphors can help to see how technology is characterised and reality is perceived (Carbonell et al., 2016), raise awareness of perspectives that misinterpret reality (Ossewaarde, 2019) and understand more tangibly technologies that are abstract and difficult to grasp, like the IoT (Cila et al., 2017). They may also help frame how people understand and see Machine Learning in the early design stages (Dove and Fayard, 2020) and support the framing of the situation to explore the design space among stakeholders (Dove et al., 2018).

To deal with unexpected changes and embrace the different complexities that can emerge over time, the discipline of futures literacy builds on the field of anticipation (Miller, 2018) to offer ways to imagine futures and use those futures to influence and innovate the present. The future does not exist; however, through anticipation, we can perceive and become aware of the assumptions we embed in the future (Miller, 2018). Based on the premise that what we do now influences the future, the question shifts to how we can involve people in organisations to engage in ways of seeing that directly embrace explorations of uncertainty and cultivate the capability of futures literacy so they can move closer to their desired futures. UNESCO (2014) developed the Futures Literacy Knowledge Laboratories method to “improve the ability of organisations at all levels and worldwide to use the future more effectively for decision-making” (UNESCO, 2014). This capability is a skill that can be measured by attending to six constructs: critical thinking, open-mindedness, creativity, self-efficacy, empathy and less need for a structure (Boer et al., 2018).

One way to support the collective exploration of technological futures is to invite people into collaborative design methods that contain activities (Brandt et al., 2012) with a human-centred focus (Mattelmäki et al., 2011). In collaborative design, when involving non-designers in technological ideations, participants must overcome their lack of technological knowledge to understand what the technologies offer and express their desires (Simonsen and Robertson, 2012). The designer can present the technologies from a perspective of what technologies do instead of how technologies work (Harper, 2019) and can rely on generative activities like making, telling and enacting to scaffold participants in externalising, expressing and role-playing their ideas and imaginations (Brandt et al., 2012). Design tools support the framing, explorations and externalisation of design situations (Dalsgaard, 2017) and include props like cards, 3D mock-ups, collages, improvisations, stories and enactments (Sanders et al., 2010). Such stories and enactments can be further augmented through notions of speculative design (Dunne and Raby, 2013), speculative enactments with participants (Elsden et al., 2017) and blending speculative design with artistic methodologies (Bozic-Yams and Aranda-Muñoz, 2021). In this regard, artistic interventions can be understood as processes where people, artefacts and methods from the arts enter the realm of organisations to trigger development (Grzelec and Prata, 2013). This trigger happens when the artistic world clashes with the organisational world, provoking new ideas and reflections on a deeper level for the organisation (Grzelec and Prata, 2013). For example, artistic interventions can help participants become more creative and braver in trying new ideas and more open processes (Sköldberg and Woodilla, 2013).

3 METHOD

To prepare the organisation for the rapid transformations in the future of learning and competence development at work, impacted, among other things, by the adoption of new technologies, we designed a five full-day workshop methodology from February to June 2022 that included (1) exploring the present situation in the organisation, identifying both strengths, challenges and desires for change, (2) immersing and exploring possible futures through co-creation of different future scenarios, the (3) creation of speculative stories about future roles that will impact and enable learning and competence development at work, the (4) prototyping different ways of using new technologies in these future roles, and (5)

reflecting on the learning and identifying potential projects through which knowledge and ideas developed in the workshops could be implemented and disseminated in the organisation.

This paper focuses exclusively on the fourth workshop (on the 4th of May, 2022) because this was the main workshop aimed at exploring new technologies. The focus was to build on results from previous workshops and "explore how new technologies can strengthen the organisation as enablers of future skills development". Seventeen (17) participants attended this workshop, including a broad representation of roles inside the organisation: nurse, doctor and dentist teachers, HR and managers.

The researchers that undertook this study were a senior Interaction Designer (PhD student) with a background in computer science and two senior researchers in Innovation and Design Thinking. For the workshop, an insider-outsider approach was taken to gather a broad range of empirical material. From an insider perspective, the PhD student prepared and facilitated the workshop. A senior researcher engaged in observations, taking field notes, photos, and video recordings of the participants' presentations. At the end of the workshop, the participants answered three open questions to reflect on their experiences: How are you feeling, and what will you take away from this workshop? In what ways have the methods we used in this workshop been useful or challenging for you in exploring the future? How could you use the lessons/tools/results we have learned from this process in your team/administration? From the external perspective, the other senior researcher performed reflective discussions with the facilitators, the artists and selected participants. In the analysis, the researchers' empirical material gathered during the workshop was typed, documented and sorted chronologically on a Miro board. The material includes pictures of the clay models, the four design fiction written in the form of a pitch, video recordings of the participants' enactments, transcriptions of the enactments, and written reflections by participants at the end of the workshop. The empirical material was analysed through an affinity diagram session with the three researchers and complemented through reflective sessions over five months attending to the six constructs of futures literacy (Boer et al., 2018). During these months, discussions with contact persons inside the organisation and the artists were considered to augment the analysis.

4 THE COLLABORATIVE METHOD

The workshop lasted approximately six hours and consisted of ten activities (see Figure 1, steps 1 to 10). During the introduction (step 1), the two researchers (acting as facilitators) welcomed the participants and presented the outcomes from the previous three workshops.

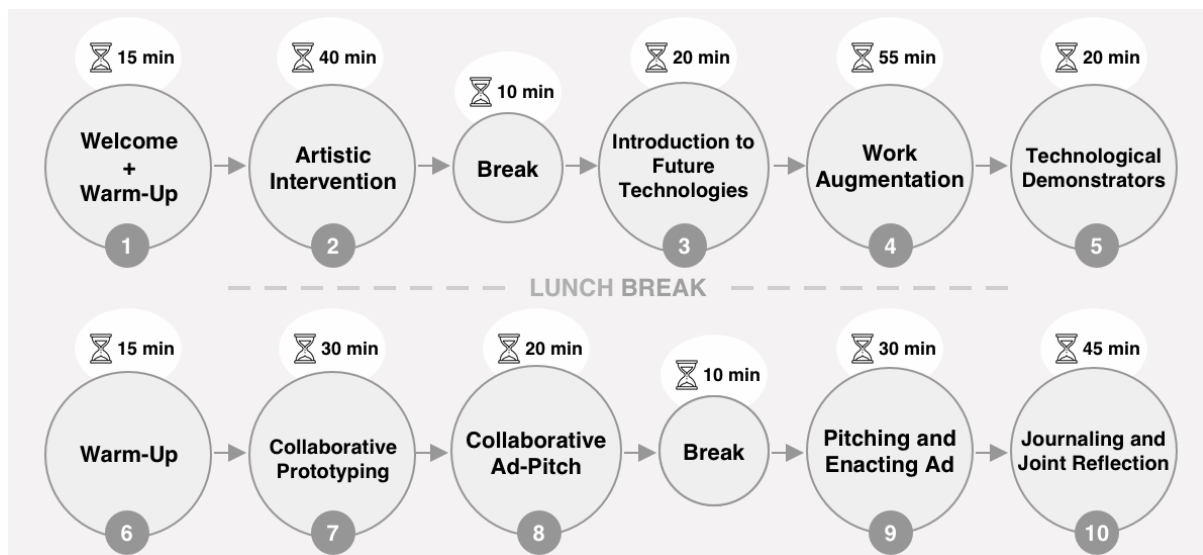


Figure 1. Diagram of the activities facilitated during the workshop.

The researchers and a contact person from the organisation reminded the participants of the overall goal of workshop number four: "to explore how new technologies can strengthen the organisation as enablers of future skills development". This welcoming was followed by an artistic intervention (Step 2) called "The Heartists are Present", with the topic of IoT as a way to open the design space beyond collecting and communicating data. After the artistic intervention, the PhD student introduced technologies that can affect the education and healthcare sector (Step 3) based on a future of jobs

survey report from the [World Economic Forum \(2020\)](#). The presentation focused on what technologies do, not how the technologies work ([Harper, 2019](#)). It included technologies and examples from the Internet of Things, Artificial Intelligence and Machine Learning, Augmented and Virtual Reality, and 3D printing. All the examples were taken from case studies and literature on healthcare or education. Then, the participants were divided into groups of four and five members. Each group explored their results from previous workshops attending to the four different future roles they had created in a previous workshop that could act as enablers for learning and competence development in the future. To facilitate step 4, the researchers created a deck of cards that acted as a reminder and repository of technological possibilities and potential wicked problems related to technology for participants (see Figure 2). During this activity (Step 4), the participants had time to individually explore the cards and reflect on the future role of making a prototype with clay that could help this future role. At the end of the activity, each participant shared in the corresponding group their clay creation, discussing the needs of the future role and how technology could help augment that role in the process.

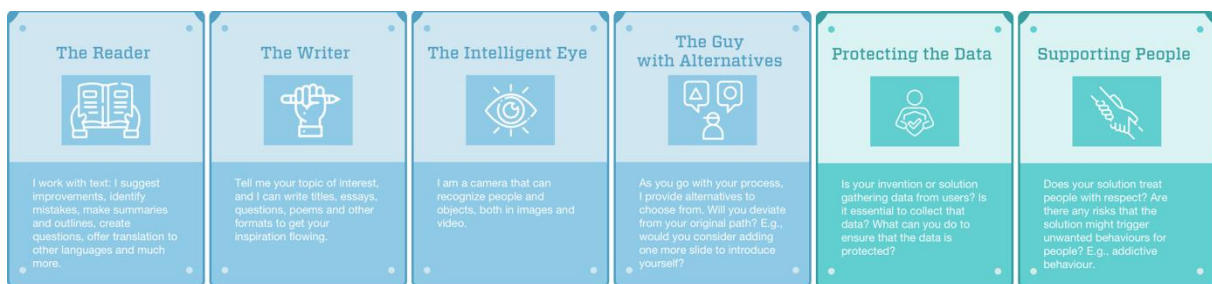


Figure 2. The technological cards and wicked problem cards.

In step 5, the PhD student presented two demonstrators exemplifying Machine Learning. The first demonstrator was the Teachable Machine ([Carney et al., 2020](#)). During the presentation, the PhD student explained the process of creating, training and testing a machine-learning model with pictures taken from a laptop. The second demonstrator was [OpenAI \(2022\)](#), mainly presenting to participants the generation of natural language through examples of writing e-mails, answering e-mails, summarising texts, generating questions and answers, and creating outlines. The idea was to show participants what AI can do for them in their work context. At the end of the demos, the PhD student revealed that the presentation of the technologies was written by OpenAI (based on inputs, selections and revisions by the researchers) and that the presentation design was done through the AI of PowerPoint Designer suggestions. Some minutes were dedicated to discussing and answering some of the participants' questions, as ethical, copyright and assistant themes emerged for discussion topics. After the lunch break, participants took their clay prototypes and walked around the room space as a warm-up (Step 6). Each time a participant met another participant, they had one minute to pitch their idea to the group. Then, the participants went back to work in groups to create a prototype building on their previous individual ideas and focused their discussions on the context where the prototype would be used, how the future role would interact with the prototype and for what purposes. To build this prototype (Step 7), participants could use clay and old electronics (see Figure 3).

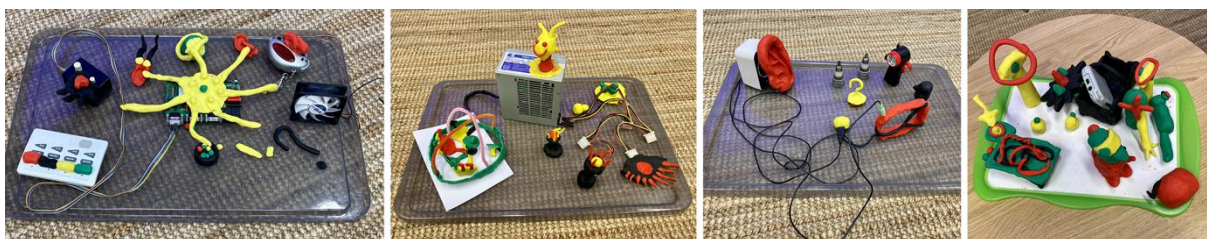


Figure 3. Each group of participants created a clay prototype with old electronics.

As a follow-up, the participants thought about how they would advertise their prototype and how they would enact it in front of an audience to present it (Step 8), considering the name of the product or service, the problem that it solves, for whom the prototype is (for the future role), and in which type of situations would the prototype be useful. One participant from each group was responsible for documenting the process and writing the advertisement. This person also had the task to continue

further the design fiction with the other participants for the next workshop, sending a one-page design fiction to the researchers a few days before workshop number five. Then, the participants pitched their prototypes in groups, enacting scenarios of use and telling how the prototype would be valuable for the future role they had selected. In these enactments (Step 9), participants embodied different future roles, others acted as narrators, and others sang the slogan for their prototypes. As a summary of the prototype outcomes (see Figure 3), in group 1, the participants ideated “Spectra”, a tool that supports learning for caregivers in real-time healthcare contexts. In such an environment, “a real situation with a patient unfolds, and the caregiver receives direct feedback in their practice”. Group 2 ideated the tool “Go-Coach” to address “situations where conflict may arise or where cooperation is not possible”, intending to support “leaders who want to use technology to manage their employees better, smarter and with more empathy”. Group 3 prototyped “Sirius”, an ear that employees can use to confide in “work situations where they experience discrimination or other types of unethical behaviour from colleagues or managers”. Lastly, group 4 prototyped “Digital Care Support” to help in “the distribution of knowledge so that everyone can become a specialist [...] where they are when the need arises”. After this activity, the researchers gave each participant a paper with three open questions to reflect on their experiences (step 10). During the last thirty minutes of the workshop, the participants and researchers sat in a circle. Each individual shared their reflections and experiences from the workshop.

5 THE ARTISTIC INTERVENTION

The artistic intervention lasted approximately forty (40) minutes and consisted of a presentation of an IoT prototype and a performance called “The Heartists are Present” (Garneij and Hookway, 2021). The Heartists (see Figure 4) is a prototype that consists of two earring sisters named “Hildur” and “Amanda” that communicate with each other through the internet. Each earring module includes sensors, haptics and LEDs. The earrings are presented through a performance with participants, where two people wear “Hildur” and “Amanda”, respectively. The wearer can feel the heartbeat of the other person through haptic feedback at the same time that the wearer is communicating their heartbeat to the other person.

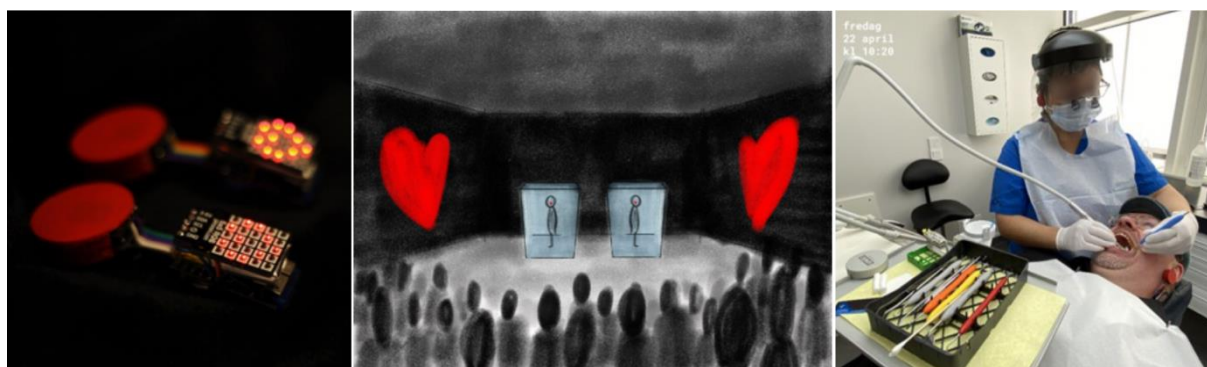


Figure 4. From left to right, Heartist earrings; sketch of two volunteers using the Heartists; and dentist and patient testing the Heartists in a dental clinic. Studio Alight pictures.

The designed fiction performance aims to explore the language of hearts and deviates from framing IoT as a way to collect data. Instead, the performance seeks to open the design space from a perspective of augmenting human empathy. In the artists' words, “the choice of gestalt in the form of earrings comes from a desire to ‘convey’ and ‘feel’, as opposed to ‘measure’ and ‘record’ which is the usual thing to do with a pulse. I wanted a clear distance from pulse bracelets, watches, hospital finger clips, and EKG pads [...] I want a feeling that I am close and can feel closeness” (Garneij and Hookway, 2021).

The artists conducted the intervention with four volunteers among the participants. Two volunteers attached Heartists to their ears, and the four volunteers received a script to read aloud and act. The enactment involved a guided exploration of the language of hearts between a dentist and a patient. Once the enactment finished, the artists asked the rest of the participants (the audience) to join in a reflective discussion about what all the participants had experienced. The two wearers of the Heartists recognised that it was confusing to initially feel the heartbeat because they were unsure if it was their heartbeat. However, the participants realised they were feeling each other's heartbeat at some point during the performance. Then, the participants from the audience shared their reflections, and the discussion shifted towards the current role of technology in their organisation, essential values for

them as professionals like empathy, and other themes such as gathering and sharing sensitive information and ways in which technologies and inventions like the Heartists could become part of real context scenarios.

At this point in the discussion, one of the artists mentioned that, given that he already had an appointment with a dentist before the workshop, he planned a test with his dentist to introduce the Heartists to a real-life scenario. The artist shared a picture (see Figure 4), his personal experience, and some of the comments he received from the dentist. An important aspect that emerged for the artist as a patient of dental care was that during a dental procedure, verbal communication is constrained. As a patient, he experienced relief knowing that the dentist was feeling his heartbeat through haptics. From the dentist's perspective, the dentist shared that she became more aware of the patient's heartbeat (artist). In some situations where the heartbeat increased, the dentist talked to the patient (artist), mentioning that the dentist knew it was painful. After the artist told his experience in the clinic, some participants reflected on this experience. One participant shared that as a nurse educator, she felt angry because she always thought that technology was something that the IT department would provide for the organisation. Now, she realises how important it is for educators from the organisation to be involved in technology discussions. Otherwise, essential values for them as professionals would not be represented in the choice of technologies.

6 RESULTS

Based on the affinity diagram session guided by the six constructs of futures literacy (Boer et al., 2018), we found some themes that match the six clusters corresponding to futures literacies (see Table 1).

Table 1. Summary of results based on the six constructs of futures literacies

Empathy	We could observe shifts of perspective and participants sharing their feelings for others. For example, some participants reflected on the script enactment between a dentist and a patient, as they could identify with the dentist and patient characters of the story. Some reflections touched on topics like empathy in professionals and what values they want to support in the organisation (dentist perspective). Some participants felt uncomfortable collecting sensitive information and employing intrusive technology (patient perspective). Another example includes the nurse educator who realised that it is vital to be involved in technology discussions, as otherwise professional values can be lost depending on the choice of technologies. The sense-making capability also supports such an empathic perspective. In their reflections, the participants expressed why the tools and methods were appropriate to collaborate and externalise other participants' views to work on a shared vision. For example, the cards "work well in different contexts to start conversations in the group and between employees", the cards "help to shape and externalise ideas. Help to "put words to the ideas" and "help to make problems visible".
Critical Thinking	Some reflections from participants point towards examining underlying aspects of the futures they explored and their role in such futures. Examples of participants' concerns include "losing previously obvious skills because of technology", "afraid the ethical dilemmas don't get enough space" in the coming future, and "an inner resistance to 'manipulating' our human characteristics with technology".
Need for Structure	We could observe how participants dealt with ambiguities and novelties (e.g., how a digital tool can support real-time learning), exploring and enacting scenarios together, building on each other's ideas and discussing alternatives when creating their prototypes. Some participants reflected on some struggles they had to overcome during the workshop, as it was "hard not to get stuck in previous ideas" and it was a "challenge to think in a new way".
Creativity	Some participants reflected on how the methods supported thinking beyond their normal thoughts about their daily work, as the methods were "useful to think freely and focus on needs", and "the methods were mainly unexpected: clay, but turned out to be very creative". However, for a participant, it was "hard not to ramble too far, keep it on a somewhat reality-based future", and one participant reflected that it "takes some time to get into the creative thinking/working mode".

Open-mindedness	Some quotes show appreciation for how the artistic “intervention opens up the mind” and how the methods helped “open the mind”. Participants also shared similar reflections at the end of the workshop, emphasising the open atmosphere to share their ideas and listen to others’ ideas respectfully.
Self-efficacy	The participants reflected on potential organisational changes and their need to be ready: “the future will be more digital, and we need to welcome the new ways of working that they bring”. In such future, they reflected on how “people and human skills are still (and maybe forever) the most important and something to cherish”, taking into account the “respect for ethical needs, not letting technology control us”. However, a few participants struggled to imagine their ideas being incorporated into the organisation: “I find this hard to see within the sluggish organisation (sob!)”.

Besides the six clusters, other themes emerged, like the appreciation of the exercises (“fun and good exercises”, “the mix itself, the set-up itself was appropriate”), the artistic intervention (“fun and concrete example at the beginning, the heart rate monitor”, “good and concrete link to a real event where new technology is tried in our everyday life”), the presentation about technology (“presentation was very interesting”, “good with concrete tools and examples of XR”) and the potential use of AI today in their jobs (“how AI is used in everyday life” and “using AI” at work).

Based on the journaling reflections, the dimension of “fun” emerged in the affinity diagram with twelve (12) participants mentioning explicitly that they felt “good”, “happy”, “with hope”, “inspired”, and “happy and full of energy”. These positive commentaries reflect the focused and fun atmosphere observed by the researchers during some parts of the workshop. For example, in the final presentations that were recorded and transcribed, the presentations were stopped eighteen (18) times between two and five seconds because the presenting group and the audience (participants) were laughing. Some participants reflected on this atmosphere, as it is “important to have a sense of humour and create a relaxed atmosphere”, underscoring how the workshop “inspired playfulness”.

7 DISCUSSION AND FUTURE WORK

Initially, the participants focused their time on discussions about what type of technologies could augment future roles in the organisation, externalising their ideas through the creation of clay prototypes. During this co-creation process, the participants considered and discussed various alternatives with their colleagues, mediating discussions through the artefacts they created. In these discussions, some topics received more attention from the participants, especially regarding what values they find meaningful at work, ethical aspects of technology, how technologies could help to augment their skills considering which values and skills the participants found necessary in their organisation, what is the current perspective on technology from the organisation and how technology could improve their current way of educating health professionals. We interpret that some of these discussions resulted from a perspective shift triggered through the artistic intervention, which can be considered a “clash” between the logic of organisations and the logic of artists (Grzelec and Prata, 2013) and a way of seeing that raised awareness (Schön, 1993) on a different perspective that can help open up exploratory futures (Miller, 2010) with technologies like AI (Miller and Tuomi, 2022).

Technology was not portrayed as another technological system to collect data that promises more effective work. Instead, the perspective portrayed through the artistic intervention was to augment human skills, specifically empathy. In this regard, we see that the artistic intervention directly supported constructs of futures literacy (Boer et al., 2018), especially the shift of perspectives (empathy), raising awareness towards feeling concerns, sympathy and worry for others (empathy), bringing more uncertainty and novelty to the workshop (need for structure) and triggering discussions among participants. An example of this effect is the reaction and reflections from the participant who had not considered her job related to technical discussions until the workshop. During the artistic intervention, she felt angry because she realised how important it is for her and her colleagues to engage in conversations about technology; otherwise, the risk that everyone in the organisation would face would be to miss on essential values they have to protect as professionals in the organisation. Concerning this example, we see that the participant could see beyond what technology usually promises (critical thinking) and change her perspective considering the essential values of her profession to propose a new vision for the future, what Miller (2010) would describe as “seeing the present differently”. In the same

manner, many other participants shared reflections and concerns about ethical aspects of technology, surpassing their initial thoughts on how technology could solve any potential problem and considering instead what are the aspects and values they consider most important at work and, from that perspective, how technology could support such values and needs for them. In this regard, the artistic intervention contributed to challenging the misplaced metaphor of “technology is progress”, which is an example of how futures literacy as a skill helps to use the future in the present (Boer et al., 2018).

The implication we see for theoretical development is that artistic interventions can be a way to support alternative ways of seeing in futures literacy workshops. These interventions can scaffold “rigorous imagining” (Miller, 2010) and challenge perpetuating views of technology or misplaced metaphors. Some examples of such metaphors related to society are the ones described by Ossewaarde (2019) and concerning technology, the ones by Carbonell et al. (2016). In this respect, artistic interventions can be seen as a way to present new ways of seeing and understanding to participants, what Schön (1993) calls generative metaphors. Such generative metaphors can be designed to help augment more human-centred aspects and diminish techno-centric views often found in engineering discourses regarding futures. Moreover, following this design perspective, we see that notions of collaborative design can support the sense-making capability and creativity, supporting participants in externalising their ideas to reach common understandings (Dalsgaard, 2017) in exploring open-ended interpretations (Mattelmäki et al., 2011) and with generative activities of making, telling and enacting (Brandt et al., 2012).

A limitation of our pilot study is that our empirical material collected comes from one workshop. However, we have observed similar results in previous work that blends speculative design with artistic methodologies in the context of the future of work (Bozic-Yams and Aranda-Muñoz, 2021). As a follow-up for this pilot study, we created research initiatives based on participants' results for new projects in collaboration with the same organisation. One of our aims is to extend the artistic interventions beyond the workshop format to question and explore the future roles collaboratively, prototypes and competencies participants have created and discussed during this workshop. Our future aim is to plan role-playing interventions of full days by artists and actors in the healthcare educational environments of the organisation. In such interventions, the artists will role-play future roles created by the participants with the participants' prototypes. The intention is that participants can enact with the artists the futures they created to understand and comprehend the premises underlying their future conceptions at a deeper level so that later, they can reflect on these premises and act on them in the present.

8 CONCLUSION

In this paper, we introduced a collaborative method that includes an artistic intervention and various speculative design activities to involve people in exploring futures where technology can augment their skills and competencies at work. We facilitated a workshop with seventeen (17) participants to observe the method in use. After the workshop, we collected the participant's outcomes: clay prototypes, design fictions, video-recorded presentations and written reflections. Based on our observations and the analysis of the empirical material collected, the results suggest that combining the artistic intervention with the speculative design activities supported participants in challenging technology misconceptions (misplaced metaphors) and helped them see and create alternative futures. Such futures embed technologies that support and reveal participants' values and ethical concerns in their workplace. These underlying considerations are vital when considering the capability of futures literacy.

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