Design with More than Humans: Reimagining Social Biomimicry through Collaborations in Learning, Performance and Coauthorship

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Design with More than Humans: Reimagining Social Biomimicry through Collaborations in Learning, Performance and Co-authorship

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Abstract

The aim of this paper is to explore the roles and transformative potential of co-authorship with more than humans (MTHs) through biomimetics. Specifically, how can social biomimicry be reimagined through collaborations in learning, performative practices and co-authorship? Furthermore, how can such collaborations inform models of shared learning spaces for new knowledge transformation in society? To address these questions, this paper presents two case studies on the *Nakagawa* (Naka river) in Fukuoka (Japan), and the Kemi river in northern Finland. Methodological approaches include ethnographic action and analysis. Several entry points for co-authorship with MTH's through biomimicry revealed themselves, represented though the cormorant, kingfisher, dragonfly and salmon. MTH co-authorship presents opportunities to foster a new conscious and engaging push to change habits and adopt virtuous behaviours and attitudes of collaborative learning that encompass plural design and transition. Biomimicry through explorative, meditative, and performative practices present embodied opportunities for such behavioral and attitudinal shifts required to address societal challenges.

Keywords: More than humans, biomimicry, co-authorship, social design, transition, plurality

Introduction

Nature remains an unlimited source of inspiration. Nearly a quarter of a century ago, Latour (1999) called for breaking with modernist frameworks by moving to alternative and plural frameworks that consider the natural environment and include more than humans (MTHs) to sustain life on a scarred planet. By MTHs, we mean every form that assumes an entity displaying some human attributes or, after Bourriaud (1999), materials or media that intrinsically bear qualities that are informed by, resemble, or carry recollections of humanity's actions. However, in this paper, we include pluriversal ontologies of being in this world and (active) becoming (Allport 1955; Escobar 2020). One example is the environmental personhood prescribed to the Whanganui river in New Zealand in 2017 (Hubberstey 2021). The last few decades also saw a rise in interest in attempts to use biology, design and engineering to reshape natural systems with the aim of developing more sustainable futures.

The aim of this paper is to produce new knowledge about the roles and transformative potential of coauthorship with MTHs through novel arts-based methods and processes for the creation of a more pluriversal world (Miettinen et al. 2023). Design inspiration derived from the natural world, often represented as biomimicry (Benyus 1997), can generate a plural understanding of, and solutions to, societal complexities through social innovation (Fewell 2015).

Spanning fields of research and practice in the areas of social and transition design (Tonkenwise n.d.), this paper presents two case studies on the *Nakagawa* (shortened to the Naka) in Fukuoka (Japan) (Inamura 2022), and the Kemi river in northern Finland (Miettinen and Sarantou 2021), thereby reflecting on, reimagining and expanding social biomimicry observation as a design approach that encompasses social design. This paper asks the following questions: how can social biomimicry be reimagined through collaborations in learning, performative practices and coauthorship? How can such collaborations inform models of shared learning spaces for new knowledge transformation in society?

The researcher-authors of this paper and the communities in Fukuoka (Japan) and Rovaniemi (Finland), participated in the case studies. Methodological approaches included ethnographic observation and analysis to identify opportunities for biomimicry that could be embedded in approaches to co-authorship and design. The ethnographic studies delivered visual data that were analyzed using methods of visual analysis to draw conclusions about the social functions that are supported by and connected to the rivers. In each of the case studies, societal issues were identified and acted on by the communities. The observational phase was followed by prototype-making workshops in the form of design jams and arts-based methods and performative practices as methods of resistance and care by both communities. In co-authorship with the two rivers and their surrounding environments, the results were visually documented as second and third data sets and analyzed through collective autoethnography by the author-researchers. In the following sections, we present the two cases.

Case 1: Nakagawa, the Naka River

Figure 1: The Naka as a living and lifegiving being where life and creativity are continuously changing and evolving around the daily lives of communities who live and co-exist with it. Photography by Sarantou (2023).

The Naka has been a field for continued research through design. The river runs through the centre of the city and flows around Nakasu, the centre of night life in Fukuoka. The name draws from the ancient name for the land, noted for the golden imperial seal that permits the king to rule the Kingdom of Na. This seal is stored in the Fukuoka City Museum. The cultural importance of the river is understood, yet its ecological importance is easily overlooked. The river flows close to the research campus of the authors and the nearby landscape can be seen (Figure 1).

The river is home to diverse flora and fauna (Yoshimura et al. 2005). Multiple projects are being conducted on the river to engage in and regenerate the river. The Nakagawa River Conference (Nakagawa Mirai Kaigi, from here on NMK) was established in 2021 as part of this local effort across sectors. Corporate employees, tertiary and primary schools, local organizations and community halls have been involved. Practical projects have been developed to create participatory future plans, with and independently from the NMK. Prior work on the river has introduced the potential of observation from MTH perspectives, such as fish and bird point of view (Inamura 2022 and 2023). Design-based exploration of the river presented opportunities for embodied and biomimetic sensing and exploration. The following section will present examples of biomimetic approaches and viewpoints tested on the Naka from 2018 onwards.

Bird's eye view: The Cormorant

Cormorants are seen on the river, swimming or often resting on artificial structures. They are traditionally trained in Asia for their ability to fish (King 2013). They are adept at swimming using their webbed feet to navigate the river. A way to experience the river from the Cormorant's point of view is to paddle through the water. A local partnering nonprofit, Fukuoka Kaihin Sports, has collaborated in coaching the skills for Stand-Up Paddle (SUP) board on the Nakagawa as part of education, leadership, and community development.

The head of Fukuoka Kaihin Sports, Masatsune Yoshimura, provided coaching in safety and skills. Beyond this as an experienced steward of the river, he imparted many stories of growing and playing on the river as a child and the way in which the river has been altered by anthropocentric interventions. The river has gone through many renovations to make it more resistant to torrential rain and flooding. This, however, has changed the width of the river, which has changed the characteristic flow.

The augmentation of the paddle and board draws from and combines the five senses: feeling the cool of the water and wind, shifts of visual perspective, smells as well as kinesthetic and exploration on the river. Starting from sitting low to the water and then standing on the board allows for shifting proximity with the water. The resistance felt through the hands on the paddle and feet on the board are touch points with the river. Once comfortable in balancing and paddling, the movement with and through the flow of water and wind becomes at once an ephemeral choreographic and collaborative act.

Through this free explorative mode, the river opens paddlers to observe flora and fauna, such as fish, insects, and birds as well as land and water-based plants. From the river, we began noticing floating rubbish such as plastic bags, bottles and cans caught in the watercress and roots near the growth on the riverbank.

Figure 2: Cormorants on the Naka. Photography by Inamura (2019).

Figure 3a: The Naka Hub concept developed. Diagram by Schneeberg, Carioni, Vasile and Inamura (2019).

SUP exploration and walks along the river have been followed by facilitated meditative method sessions for ideation and visualization. The tangible output of future visions for the river were developed by master's level student designers (Figures 3a, 3b). The student team was Benedikt Schneeberg (product), Claudia Carioni (interior architecture) and Valentina Maria Vasile (interior architecture) n.b., for elaboration of the meditative methods, see the referenced chapter (Inamura 2023). The vision has been presented to local communities and government, as well as used as the basis to develop future visions of the NMK.

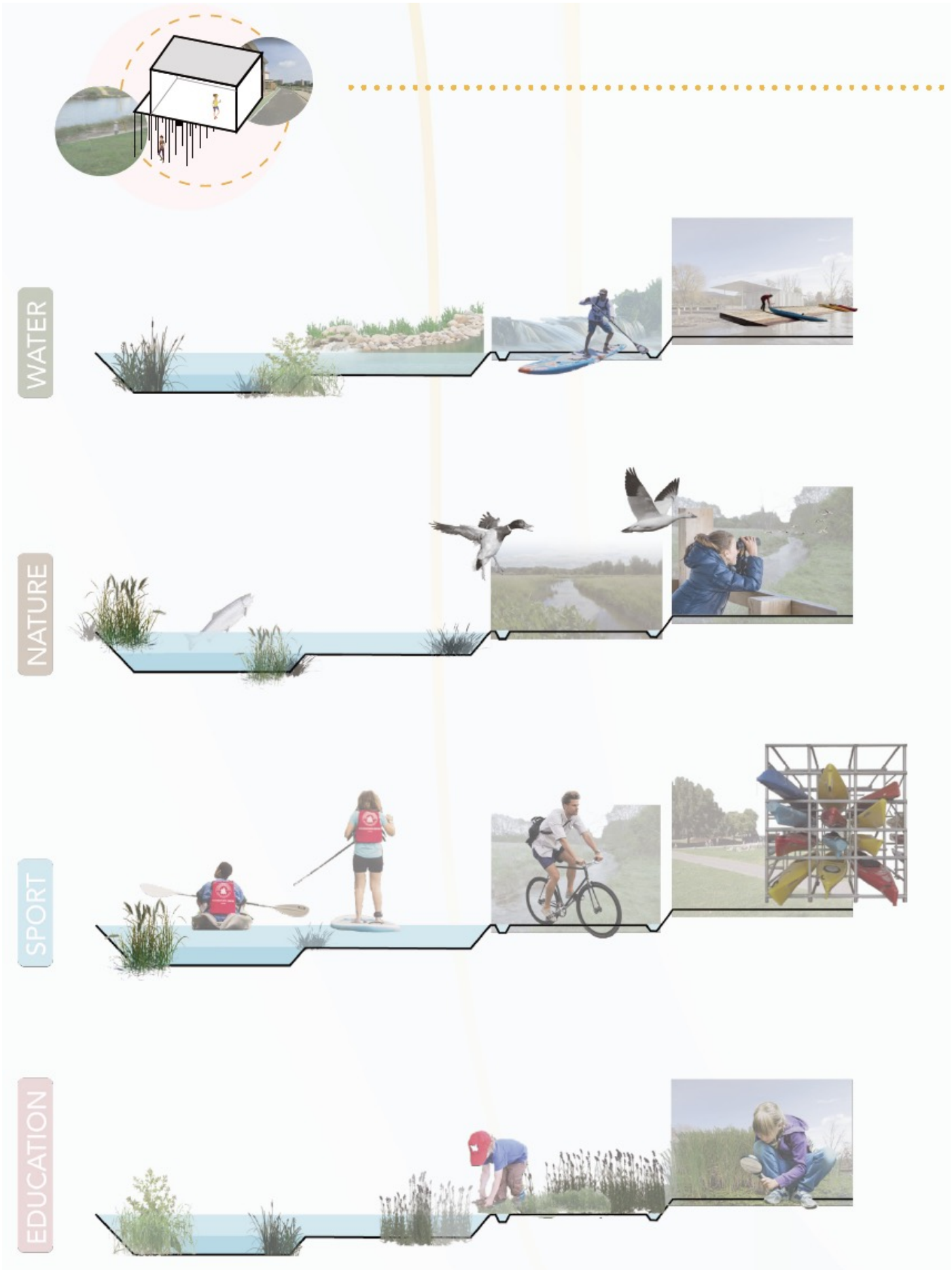

Figure 3b: The Naka Hub concept developed. Diagram by Schneeberg, Carioni, Vasile and Inamura (2019).

Bird's eye view: the Kingfisher

The Kingfisher is a specific species on the river and is the symbol of the eponymous Nakagawa city lying upstream in Fukuoka prefecture (Nakagawa City 2014). It is also one of the most iconic examples of biomimetics applied to Shinkansen bullet trains (Primrose 2020). The avian family became thematic during the Global Goals Jam in Fukuoka, an annual event developed by the United Nations Development Programme and the Digital Society School, where Inamura was a co-organizer. One team was responsible for the river's sustainability. Inamura identified a photographer on the riverside who was originally taking photos of birds, to look for Kingfishers. The photographer noted that the birds required perches to dive into the water and fish. Based on such exchanges, the final output proposed was a design for both humans, kingfishers and surrounding river ecosystems to thrive (Figure 4a). The curiosity of bird watchers and their constant engagement with avian species are examples of important communities of co-authorship.

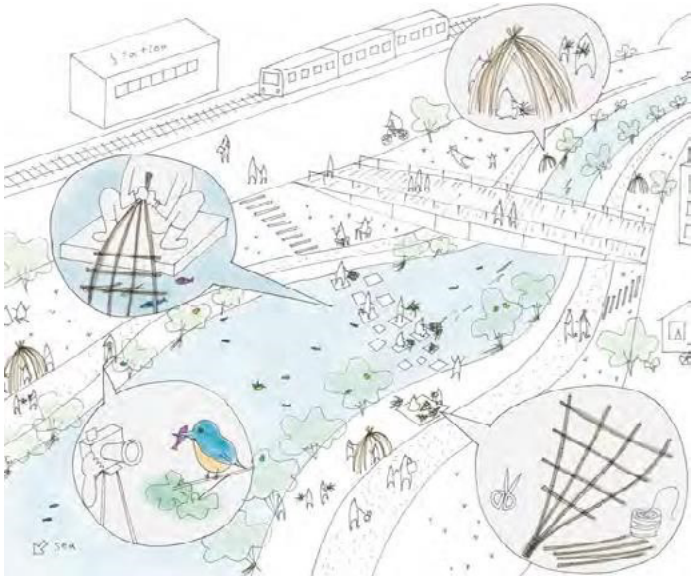

Figure 4a: Result of co-authored space creation and activities of care in a collaborative workshop space 'design jam'. Design by Hayako Oba,Shizuha Heta, Yan Gan, Elisa Desestret, Yuechen Gu and Inamura (2018).

Insect view: The Dragonfly

Co-authorship on the river is not only reliant on empathetic or conceptual understanding, but also on cognitively having access to spatial and structural understanding of the river so that sensemaking can occur. The dragonflies that hover and inhabit the river negotiate the space with ease. The dragonfly is a popular cultural motif exemplified by the nursery song Aka-tombo (Mitchell and Lasswell 2005). The movement of remote-controlled drones with the capability to hover and traverse is analogous to a dragonfly. Drone augmented biomimetic exploration allows for three-dimensional data through light detection and ranging (LiDAR). Drones were flown to gather three-dimensional geographical data and shared with primary school children as part of the Year 12 class, alongside learning about local fish species and SUP demonstrations (Figures 4b and 5). This was conducted as part of a visioning exercise to coauthor pluralistic visions for the Naka and its desirable futures. Both the data gathered by the drones, as well as observing the flying drones, afford the weaving of points of view of the river so that senses of space and scale can become tangible.

Three biomimetic modes have been outlined; they are entry points for coauthorship with MTH from a design approach.

The following section details the case of the Kemi in Finland in contrast with an arts-based inquiry.

Figure 4b: Drone LiDAR photography and operation by AlShawaf Bader ASAMA. Photography by Al Shawaf (2022).

Figure 5: Drone and landing pad on the banks of the Naka. Photography by Inamura (2022).

Case 2: Kemi River

This artivist (artist + activist) project was implemented by artist-researchers Satu Miettinen, Taina Kontio, Mari Mäkiranta and Melanie Sarantou in support of Professor Vesa Puuronen, who was legally sanctioned for the sum of € 20 000 for placing graffiti of two salmons and the slogans and a poem, “Eternal river is grieving the greed of people”, on the private property of the electricity company Kemijoki Oy at Pirttikoski and Seitakorva (Viinikka 2020). Puuronen used the graffiti to protest the newly proposed Sierilä power plant that will be erected on the banks of the Kemi.

Different companies and governments have exploited the Kemi and its salmon since Swedish rule through overfishing, transporting logs and wood on the river and, as a final nail in the coffin, Kemijoki Oy set up power plants during the 1950s and changed the way of life for the local communities and altered the local natural scenery. The indigenous salmon became extinct because of power plants (Niemi 2021).

The case study related to the ephemeral artivist (Penley and Ross 1991) project Five Salmon and Two Fish (*viisi lohta ja kaksi kalaa*) that was implemented on the banks of the Kemi River has been published elsewhere (Miettinen and Sarantou 2021). The artivist action was implemented by four artist-researchers from Finland, one of whom is the coauthor of this paper. The documentary artists for the project were journalists and documentary artist Antti Haase and videographer Mikko Leinonen of the production company Illume Oy, who assisted with capturing the ephemeral and performative project in March 2021. This reflection on the project looks beyond the initial project, its motivation and implementation to understand the value and role of performative and arts-based projects in design education.

The image of a large 20-metre fish that has been installed on the banks of the Kemi (Figure 6) blends gracefully with its natural surroundings. The installation was created from textile strips that were used to create a line drawing of a large fish on the white backdrop of the icy riverbank. The image of the fish was captured by a drone about 10–15 metres above the fish. The large fish appears whimsically from above, like a whimsical line drawing of a fish. The installation was created, documented and removed from the ice within a span of four hours on an early sunny spring day near Rovaniemi in Arctic Finland. A sustainable approach to the ephemeral installation was selected – for creating and documenting the artivist action, harmful impacts on the environment were reduced as far as possible; for example, the textile strips were wholly removed from the environment.

The inspiration for the ephemeral nature of the action, both the installation and the performance, was derived from biomimicry (Benyus 1997), which means innovation that has been inspired by nature. The artist-researchers observed the movement of salmon or trout in rivers when swimming upstream or when they barely showed themselves camouflaged by the dark patches on their backs, like a shadow or glimpse, in one moment visible while disappearing the next when close to the river surface. The whimsical textile installation similarly showed itself, in a moment – a well-camouflaged glimpse of a fish appeared on the banks of the Kemi, before it was removed after documenting the performance. The performance of the moving salmon generated kinaesthetic empathy due to the mimicking of movement and sensual experiences (Reynolds and Reason, 2012), which was generated from the natural

Figure 6: The ephemeral fish installation on the banks of the Kemi. Photography by Satu Miettinen (2021).

Figure 7: Artist-researchers (from left) Melanie Sarantou, Satu Miettinen, and Taina Kontio in a performance next to the installation of the salmon on the banks of the Kemi. Photography by Mikko Leinonen (2020).

environment that was closely connected to the former habitat of the salmon (Figure 7).

The value of performative and arts-based methods for design education lies in driving active and action-based learning in which students can critically reflect on the choices they make for their actions, for example, how it will impact the environment and how they can observe new and innovative ideas stemming from nature. In addition, values such as using ephemeral methods and the reusability and removability of materials used in their actions so that no unwanted traces are left in nature or outdoor spaces can be used in design education. Documentation not only supported the artivist action using place, space and textile strips sought to take a stand and raise awareness of the decline of the Kemi and its inhabitants, the salmon that have been extinguished in this area of the river (Niemi 2021). Value can be created by documenting arts-based actions as part of students’ learning experiences. Such value is vested in having evidenced actions that can be further digitally disseminated for analytical and reflective purposes to aid learning processes because such documentation “speak louder and more persistently than those (more than humans) who have been silenced” (Miettinen and Sarantou 2021, p. 47).

Discussion

Creative co-authorship with communities and MTHs can contribute to the design for plurality by providing new views and ways to design and create new values, as well as those that are embedded in design practices. Co-authorship with a living design medium refers to material production that incorporates simple living organisms, material-driven design and designing with MTHs that have agency of their own. Anthropocene as a worldview, revealing human activities that reshape nature through creativity, connecting humans and MTHs to result in intertwined worlds. Cross-pollinated anthropologies, such as the Anthropocene, enhance dialogue within a hybrid, globalizing world that includes various actors, often MTHs. In such contexts, makers, designers, teachers and researchers become experimenters, collectors, and natural agents. This entails a multifaceted exploration of contemporary material culture, requiring a border crossing between creative actions with MTHs, spaces, fields, and disciplines (Härkönen et al. 2023).

Societal challenges need solutions that drive interactions and organizational processes to deliver impact not only on a social level but on a broader societal scale, which comprises the social and environmental contexts of such challenges. To this end, researchers, artists and designers sometimes adapt or reject behaviours and patterns observed from nature to create innovative solutions. In doing so, social designers can use biomimicry to move on from approaches to social design that seem to have more ameliorative outcomes rather than results that address policy and structural change (Tonkenwise n.d.). An escalating challenge is how to change our interactions and relationships with MTHs to enable futures that can address societal challenges. Moreover, how we (re)design education through this research is paramount to generating a sustainable impact for designed futures.

The impact of this research is to present co-authorship with MTHs for reshaping pluriversal approaches to learning and new models for the implementation of shared learning spaces within different environments and with communities and MTHs. These inspiring recommendations would generate in individuals, as well as in communities, a new conscious and engaging push to change habits and adopt virtuous behaviours and attitudes of collaborative learning. Interactions with MTHs ask for tolerance, plural ontologies and views, and a reflection and reimagination of the future through ideas that should be shared and communicated verbally, visually, kinetically, or other communication channels.

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