

VOLUME 2.

Driving

Collective approaches
enriching design principles

Design

Edited by Distributed
Design Platform



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Introduction

Jessica Guy, Distributed Design Platform lead at Fab Lab
Barcelona | IAAC

In a world characterized by rapid technological advancements, shifting global landscapes, and the urgent need for alternative, meaningful, regenerative solutions, design plays a pivotal role in shaping our future. "Driving Design," presented by the Distributed Design Platform, embarks on a journey through the transformative power of design in the contemporary era.

This book is not merely a collection of theories and principles; it is a dynamic exploration of design's capacity to drive innovation, foster inclusivity, and navigate the complexities of our interconnected world. Through the lens of the Distributed Design Platform, we delve into the multifaceted aspects of design that extend far beyond the creation of physical artifacts. As our societies evolve, so must our approach to design. We advocate for a paradigm shift, challenging conventional norms and embracing a postcolonial and post-anthropocene perspective. We navigate the intricacies of design education, emphasizing the importance of breaking free from outdated systems to empower a new generation of designers capable of shaping policy-making processes.

This book is a testament to the potential of design to address the pressing challenges of our time. Join us as we venture into the realms of collaborative experimentation, where designers become agents of change, translating methods across different contexts and sectors. We invite you to explore an alternative present that is not confined to the status quo, but seeing design as a driving force behind systemic transformation.

Enjoy a glimpse into the field
of the ever-evolving field of
Distributed Design.

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Commoning approaches to combat the scarcity myth:

Designing with abundance



CHAPTER 1.

The concept of commons, rooted in the seminal work of economist Elinor Ostrom, has transcended traditional domains and found resonance in the realm of design. Ostrom's groundbreaking research challenged conventional wisdom about resource management by highlighting the effectiveness of communal governance. Commons, in its essence, refers to shared resources and the collective systems that communities develop to sustainably manage them. In design, the notion of commons extends beyond physical resources to encompass shared knowledge, collaborative practices, and the democratization of creative processes. However, in a world derived by competition and scarcity, it continues to be an intricate dance between design and interconnected narratives such as commons.

The scarcity myth has long cast its shadow over our collective consciousness, often perpetuating systems of exclusion and competition. The following articles, reviews, and profiles embark on a quest to unravel the threads of this pervasive myth, reimagining our world through the lens of shared resources and collaborative design. We are delving into the notion of "commoning," exploring the transformative power of shared spaces, collective stewardship, and cooperative endeavors as antidotes to the scarcity myth. Through the lens of design, we will explore how communities can reclaim agency, nurturing a sense of shared responsibility for the well-being of both people and the planet.

Interconnected Wave

Towards an eco-centric design approach

Federica Mandelli, edited by Line Ulrika Christiansen, Director of OpenDot, Italy

Over the last two decades, design has had to realign its role and new focal points have emerged, such as user-centred design, interaction design and information design, all of which place people at the centre. Hence the term human-centred design focuses on an experience that is tangible and/or immaterial.

Design has transcended the boundaries of making objects and has expanded into a broad and evolving field that encompasses different disciplines, each with its own focus and methods, as well as the nature of co-design. Today, co-design is an established term that describes the process of designing with people to address specific needs and/or challenges - from the individual to the international community.

With the continuous and rapid change brought about by advanced technologies, new tasks are emerging and design is evolving with approaches such as critical design, speculative design, discursive design and attitudinal design.

The big question now is how we can move from a human-centred design approach to an eco-centric focus that addresses a future that is already here.

DESIGN YESTERDAY

Today, design is understood (by designers) as a project culture that encompasses a range of creative and technical methods and approaches to solving a problem. Over the last two decades, design has increasingly evolved and gone beyond simply "making beautiful things". For this reason, design, understood as a way of thinking, has spread to countless areas.

This leap from discipline to tool gave rise to the term design thinking, whereby the method transcends the boundaries of the production of objects and extends to the design of services, interactions and relationships between people.

Design thinking expanded the idea of "design" and turned the designer into a "goddess of answers"

providing a tool for subscribers to deal with an endless series of challenges between people and things, things and technology, technology and situations, and all the transitions in between.

Although the intentions may be good, it has been shown that design thinking falls short in the execution and aftermath of an innovation. The real challenge today is not to come up with great ideas, but to understand and overcome the real challenges an idea faces in its realisation and how to sustain its development in a rapidly changing social and environmental environment that connects all people, technologies and systems, human and non-human.

In this historic period of radical change, digitalisation has revolutionised our lives. With increasing connectivity, the spread of networks, platforms and a wide variety of digital media, we are living in a phase in which everything is on the move. As a result, systems are becoming increasingly permeable, meaning that traditional ways of thinking and acting no longer work. The world is therefore looking for something that is able to manage fluid systems and complex problems that require both technical solutions and an understanding of behaviours and people to solve.

Thus, design answers the call and transforms itself, thanks to its ability to act as a bridge between the social and the technical, and as a discipline capable of thinking and realising new visions through design skills and a creative approach.

This is how what we call co-design or participatory planning came about. Co-design does indeed have all the important characteristics to cope with the complexity of our time: it is a methodology that enables people to become designers with the help of specific tools and a creative approach.

CO-DESIGN

On a practical level, co-design is about bringing a group of people with different backgrounds and skills together for a proactive discussion to develop

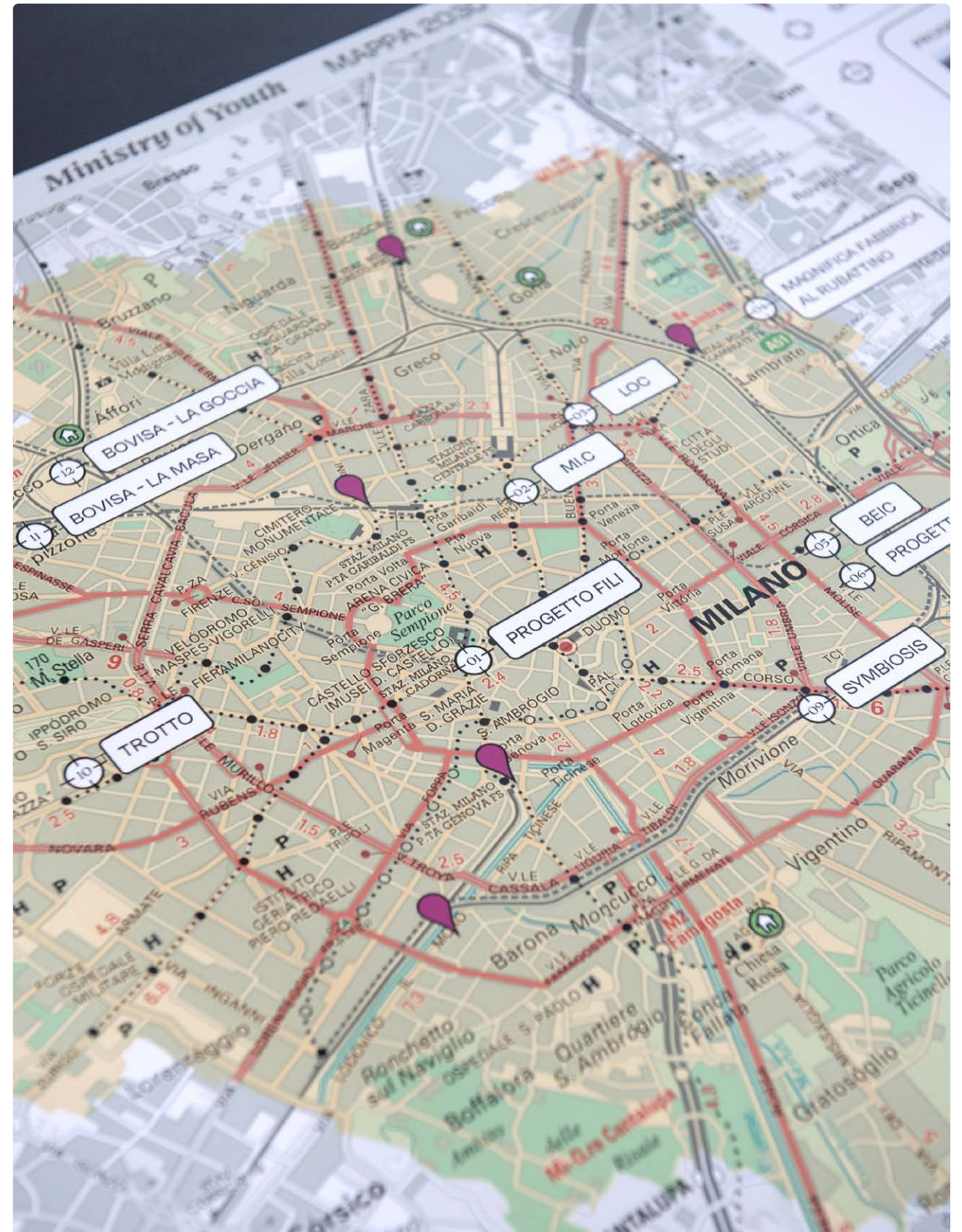


IMAGE 1. "Ministry of Youth: Milan 2030." Map of Milan with urban interventions planned for 2030 to speculate about socio-cultural-economic repercussions. A series of co-design sessions with young people 18-24 within the research project "Milan Ministry of Youth" to speculate about the future of the city of Milan (April 2023, OpenDot, Milan, OpenDot)

innovative solutions that have a positive impact on everyone involved. The designer is the one who guides and enables the process in all its phases, bridging technical skills and cultural and relational sensitivities.

The methodology consists of involving people in all project phases, starting with the definition of the need itself. In fact, planning begins with problem identification before problem-solving, because asking the right questions is the first step to finding effective answers.

Today, it is indeed no longer about "doing things well", but about creating what people desire and need. The key is to involve people in the decision-making process, understand their behaviour and measure their interactions. This is why products, interactions and even decision-making protocols or company dynamics are being co-designed today.

At OpenDot, specific technology expertise and relationship skills are juxtaposed and brought together in an approach in which people are active parties. Human and technical skills are integrated, not mutually exclusive, and the designer becomes the one who manages and facilitates the dynamics of heterogeneous groups by accompanying people in co-design and rapid prototyping, who are not only able to realise ideas but also and above all to test them thanks to iterative processes, as, for example, in the world of Fab Labs.

Co-design is therefore a discipline that supports anyone who strives for innovation and change. In other words, practising co-design does not mean having a map to improve the world, but the compass to orient oneself, and therefore participatory design adapts to the most diverse contexts.

SPECULATIVE DESIGN

In the realm of design, our creative endeavours go far beyond the limitations of the present moment. Rather than designing for the present landscape, our focus is inherently future-orientated. We are constantly engaged in projecting and envisioning a world in which our work will find its place. Even in design processes characterised by rapid change, such as publishing, the perspective remains forward-looking, always considering how people will interact with and experience our creations in the future. Our design ethos is about designing for a world that does not yet exist. This requires us to constantly imagine and make assumptions about the conditions and possibilities of the future we aspire to. This shift in focus over the last decade is evident in the increased exploration of various ecological and political scenarios, a testament to the profound impact these issues have on our collective attention and imagination.

To explore the concept of speculative design, we began a discussion with Matt Ward, a designer, author and educator¹. Our conversation centred around the importance of co-design when it comes to taking proactive and forward-thinking approaches and aligning with the principles of speculative design.

Line Christiansen: How can we proactively engage people to identify future needs and challenges that may not be immediately evident?

Matt Ward: When engaging people who are outside of the design realm and outside a future practice, the larger barriers for those conversations become about how people really start to imagine alternatives. In some ways, speculation and the imagining of different futures is really a kind of quite a privileged act.

When you move into social spheres where those privileges are limited the larger challenges are to break people out of the demands of the everyday. One of the things that I found in such situations is the patterns and demands of everyday life become all-consuming and delimit your ability to imagine otherwise, and if your future horizon is the end of the week, or the end of the month, or maybe when your child finishes school, or when you're contract ends, then your ability to think beyond that becomes really challenging.

LC. How do you deal with these challenges when you work with such communities?

MW. I have two points in mind: the power of listening and the power of positional permission. It's really important to give people a space where their ideas are heard and valued. If you listen to them and take what they say seriously, with care and attention, then that has value and in a way already does something very special, because many people find themselves in positions where their voice is not heard and they are not cared for and not listened to.

I am most interested in working with projects where people are either in some kind of special situation or in an economic reality where governments have failed and the normal structures that allow them to plan their lives have failed.

The moment you pay attention to people and give them confidence in their ideas, value is created.

LC. So how do you bring trust into the next step of the speculation process, because the transition from trust to faith in a future that cannot be promised is a delicate one?

MW. The other side of listening and instilling confidence is the attention of co-design, where designers use their skills to do things that non-designers can't normally do.

With the right confidence and the right cues and conversations, people can let go and let their imaginations run wild. What most people are not very good at is recognising which part is valuable. If you are able to communicate this to people so that it becomes communicable outside of that moment, then designers have their function.

When you take ideas seriously and render them in some kind of cultural, visual and/or physical form, it resonates and enables a conversation and confidence in the ability to think about the future.

It is important that the relationship between speculative design and critical design is a continual dance between the two ensuring that to speculate isn't to offer or to promise. That is where subjects sometimes get muddled when that idea of projecting into the future ends up not getting delivered upon. It is a continuous navigation where the designer must be able to pull back and reposition themselves when needed, as well as keeping in mind the first commitments [of the designer] - is it to deliver a different future or is it to slightly impact people to think about themselves in a slightly different way?

LC. The difficulty is often in maintaining community engagement. What kind of mechanism can be implemented to ensure that the speculative design focus remains responsive over time?

MW. This is a six million-dollar question, but I think there are two important measures; One is a long-term commitment. There's nothing worse than the quick and dirty one-night stand of speculative participatory design that says, "We will help you think about the future and then we will f*** off," which then leads to a nice appearance on a website. So the commitment has to be long-term, even if it might not always be perceived as consistent.

The other key is to focus on people and their interests. Recognising what is already very valuable in a community, but perhaps not always recognised as such. For example, in one project there was a thriving music scene in the community. No matter how difficult the social or economic circumstances were, people came together and made music together. This provided an escape and a space for imagination, and it was up to us [as designers] to recognise how valuable this was and to support and nurture it. It's crucial to support and build on the infrastructure of things that people already care about.

LC. When we talk about communities, the world is opening up more and more to the idea of non-human communities. What aspects of current design methods do you think could be implemented or would need to be changed to take non-human actors into account?

MW. I would probably call it a vital materialistic approach. The fine-tuning and awareness of agency, both human and non-human and material, how systems, politics, animals, minerals, and weather systems are interwoven in a network that is inseparable.

This interconnectedness of an awareness of the impact of all these intertwined systems is the most important understanding. The focus is on the social, technological, economic and ecological systems that go with it. I think the whole discourse is aimed at the same kind of thinking, except we are changing the perspective on what's at stake - who has the flesh in these systems.

LC. How do your students, who represent the new generation, react to this new trend?

MW. It's very difficult to take two things out of context: one is the dramatic impact of the pandemic on young people and the other is ten years of a terrible government that has destroyed creative education in schools, which has led to a decline.

What I've noticed, both as a brilliant thing and a terrible thing, is that all the students are fully interested in an alternative way of living than we're currently practising.

I really feel that people are currently dissatisfied with how we currently live, but the flip side

is that I think this generation can also hold contradictions together. I think they can be deeply dissatisfied with the status quo but at the same time cooperate with it and not see that as a contradiction.

Students are informed about their desire for a different way of life, and I believe this reflects a broader zeitgeist that is prevalent in both the design and intellectual spheres. There is a growing curiosity among people about mycelium as an alternative organisational structure. The importance of these alternative discourses cannot be underestimated, especially when considering the intellectual and philosophical standpoint that challenges the traditional white, male Western articulation of knowledge production.

It is imperative that we recognise the importance of educating and supporting young people to develop their own ontological understanding of the world. This includes engaging a diversity of human and non-human voices to gain insights from different positions and perspectives.



ECO-CENTRIC DESIGN

Human-centred design is an approach that places the needs, perspectives and experiences of users at the centre of the design process. In recent years, however, there has been a growing awareness of the need to broaden this perspective and also consider the environment and its impact.

The traditional user-centred design approach has proven to be effective in meeting the immediate needs of users but often ignores the long-term impact on the planet. Therefore, user-centred design has been enriched by the emerging concept of "eco-centric design" or "eco-design", which aims to integrate environmental sustainability into the design process.

In this context, the focus is not only on the end consumer but also on the environmental impact of a product or service throughout its life cycle. Eco-design takes into account the origin of the raw materials, the production process, the use of the product and its end of life, seeking to minimise the environmental impact at each stage. Integrating principles of environmental sustainability into human-centred design is essential to tackle global challenges such as climate change, biodiversity loss and the increasing pressure on our ecosystems. It is about creating solutions that meet human needs without jeopardising the health of our planet.

This development reflects the growing realisation that there is a link between human well-being and the health of our environment. By incorporating the environment into user-centred design, we can hope to develop more balanced, sustainable and conscious solutions that take into account the immediate needs of the individual, but also the long-term balance between humanity and our planet.

So when we talk about "Eco-Centric Design" or "Eco-Design", we mean a design approach that places environmental sustainability at the centre of the process. The main objective is to minimise the negative impact on the environment at all stages of the life cycle of a product or service and to involve human and non-human communities in the process of maintaining environmental sustainability.

IMAGE 2. "Making fashion last co-design." Co-design session in OpenDot during Making fashion last! 1st edition, a workshop held within the project "Distributed Design" to reflect and tackle challenges of durability of fashion garments (May 2023, OpenDot, Milan, OpenDot)

IMAGE 3. "Making fashion last co-design." Co-design session in OpenDot during Making fashion last! 1st edition, a workshop held within the project "Distributed Design" to reflect and tackle challenges of durability of fashion garments (May 2023, OpenDot, Milan, OpenDot)



Here are some of the key features and considerations related to eco-centric design:

- Sustainable materials** Pay particular attention to the choice of materials used in the design process. Materials should be sustainable and recyclable or from renewable sources to minimise the impact on the environment.
- Sustainable production** Reduce the environmental impact during the production phase. Includes optimised production processes to reduce energy and material waste and choosing more sustainable technologies.
- Durability and longevity** Promote the design of products that are durable and have a long lifespan, with a view to their afterlife. In contrast to the "consumer culture" approach, where products are designed to be replaced frequently.
- Reduction of waste** Strive to minimise waste at all stages of a product's life cycle. This includes strategies for recycling, reuse and reducing unnecessary packaging.
- Life cycle analysis** Evaluate the environmental impact of a product or service from the extraction of raw materials through production, distribution and use to disposal. This helps to identify critical areas and opportunities to improve overall sustainability.

On the surge of the COVID-19 pandemic shock wave, design has been given a new challenge and the holy grail of progressive desideratum, this time in collaboration with all communities, raising new questions.

The writer and educator John Thackara poses this question: "What would it mean to practise design in the knowledge that the well-being of humans and non-humans is interconnected?"²

IMAGE 4. "Ministry of Youth: Drivers of Change." Drivers of change and speculative design activity. A series of co-design sessions with young people 18-24 within the research project "Milan Ministry of Youth" to speculate about the future of the city of Milan (April 2023, OpenDot, Milan, OpenDot)

Circular Design Journal for Makers

A personalised design journal for makers to reflect upon various circular strategies to be applied in their practices

Project team

Therese Balslev &
Joanna Kowolik

Organization

Danish Design Center
& Happylab

Location

Copenhagen, Denmark;
Vienna, Austria - Europe

Project type

Circular design tool/method

PROJECT DESCRIPTION

The Circular Design Journal for Makers is designed to enhance awareness and provide tangible strategies for circular design, particularly in the early stages of product development in makerspaces and fab labs. It aims to foster a new mindset among makers and creatives by offering a total of 18 different strategies across the three life cycle stages of products and materials (start of life phase, use phase and end-of-life phase). The approach of applying the journal on an on-going basis is intended to integrate circular thinking from the outset, encouraging more sustainable and environmentally conscious innovations.

CONTEXT AND HISTORY

This project originated from an initiative to change product creation among makers and designers, emphasizing sustainable and circular practices. It started with design-driven workshops introducing a circular design framework, focusing on upstream innovation to embed sustainability and circularity in the early stages of product and business development. The thoroughly tested tool presented at the workshops thus evolved into a dynamic, reflective journal, encouraging an ongoing reflection upon the various circular strategies and principles presented.

Tested and proven at Happylab in Vienna, the journal became an accessible resource. It has guided projects, helping makers to increase awareness of the different circular strategies available. More than a guide, it's a tool for fostering a mindset shift towards environmentally conscious innovation, demonstrating its role as a catalyst for sustainable change and improvements in the maker community.

WHAT IS THE NEED IT TACKLES?

While the concept of circular design might be well-known in academic or professional circles, there's a need for concrete, actionable strategies that makers and hobbyists can implement in their work. The journal seeks to provide these practical guidelines, enabling makers to apply circular design principles in their projects effectively.



Furthermore, there's a growing recognition of the importance of sustainable practices in all areas of design, prototyping and manufacturing. However, there's often a gap in awareness about what circular design truly entails, especially among makers and hobbyists. The Circular Design Journal for Makers aims to bridge this gap by increasing knowledge and understanding of circular design principles focusing on upstream innovative thinking which aims to prevent waste and pollution and contribute to circulating products and materials at their highest value. Ultimately, this should lead to a change in mindset and design approach for the makers since a much broader reflection upon the different life cycle stages is likely to happen.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

The Circular Design Journal for Makers was developed by the Danish Design Center (DDC) and first tested at Happylab in Vienna.

As a member of the Distributed Design Platform, DDC contributes by creating open-source design-driven tools aiming to contribute to the circular transition. In this journal, DDC's primary goal is to equip makers with a practical tool to enhance their awareness and application of various circular design strategies in their projects.

Each year, DDC contributes resources to the Distributed Design Platform. For the second year of this initiative, they chose to test this resource collaborating with the maker community in Happylab. Initially, the DDC's circular framework¹ (which has already been tested and applied in several contexts by DDC) was tested in a workshop format for makers and it was subsequently decided to try to turn it into a journal format. The journal was tested in the annual Distributed Design Residency program at Happylab and is now applied as a resource to prime and influence the residents' projects in a more circular direction.

IMAGE 1. The journal that was tested in Happylab in Vienna in the Spring of 2023 (April 2023, Happylab, Vienna by Therese Balslev)

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

The tool's impact is centered around increasing awareness and fostering a mindset shift towards increased circularity among makers. It enlightens makers on the importance of incorporating circular strategies as early in the development process as possible, increasing the possibility of reducing waste and pollution and enhancing circular product design. Additionally, it prompts makers to explore new business potentials through sustainable and circular practices. Finally, the tool serves as a key resource for makerspace management to decide on a sustainable foundation for programs like residencies and accelerators, thereby integrating circular design principles and strategies in makers' creations and initiatives.

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

At the local level, a makerspace can engage with makers and designers through the use of the Circular Design Journal. The journal is rooted in global principles of circular design and by adopting and adapting these global principles to a local context, this project demonstrates how global ideas can be effectively implemented in community-based environments.

Furthermore, the journal underscores the concept that global challenges like environmental degradation and resource depletion can be addressed through localised actions and tangible resources. By fostering a culture of sustainability and circularity at a local level, the journal-- and makers' projects that it potentially can have an influence on-- can contribute to tackling these global issues.

Finally, the success of the journal in local makerspace contexts and its availability as an open resource for other makerspaces represents a potential scaling of local innovation to a global audience. This kind of scaling is crucial in the global-local dynamic, as it allows effective local solutions to be replicated and adapted in different contexts worldwide.

WHY IS THE CIRCULAR DESIGN JOURNAL FOR MAKERS DISTRIBUTED DESIGN?

By applying the journal, makers can rethink their designs, business models, material sourcing and application etc. The journal is an open-source tool and is accessible to everyone who wishes to try it out and expand their knowledge or simply refresh their memories around circular economy.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMAN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Joanna: I would like to have dinner with my daughter as a young adult - I'm not sure if I should be dead myself or not by the time we have the dinner.

Therese: Would love to have dinner with David Attenborough, real trees and some crucial decision makers to see what could come out of this...

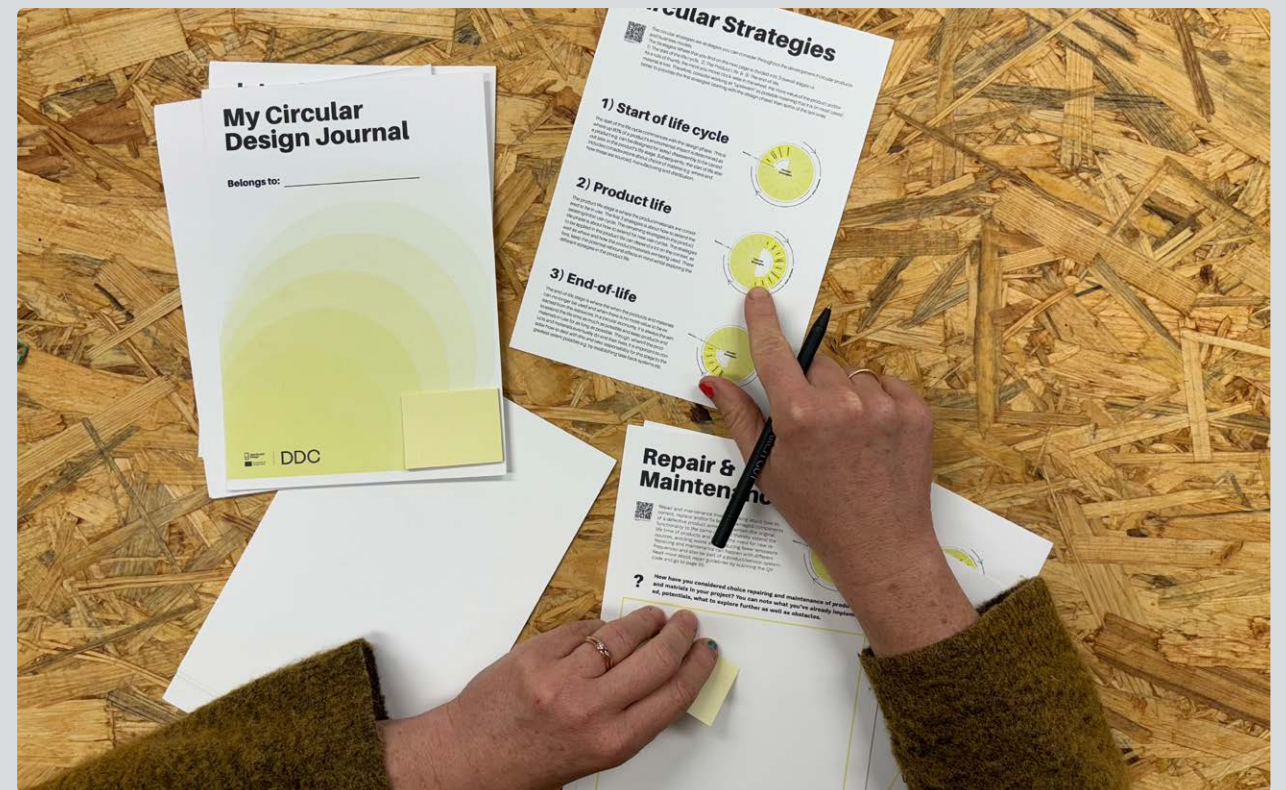
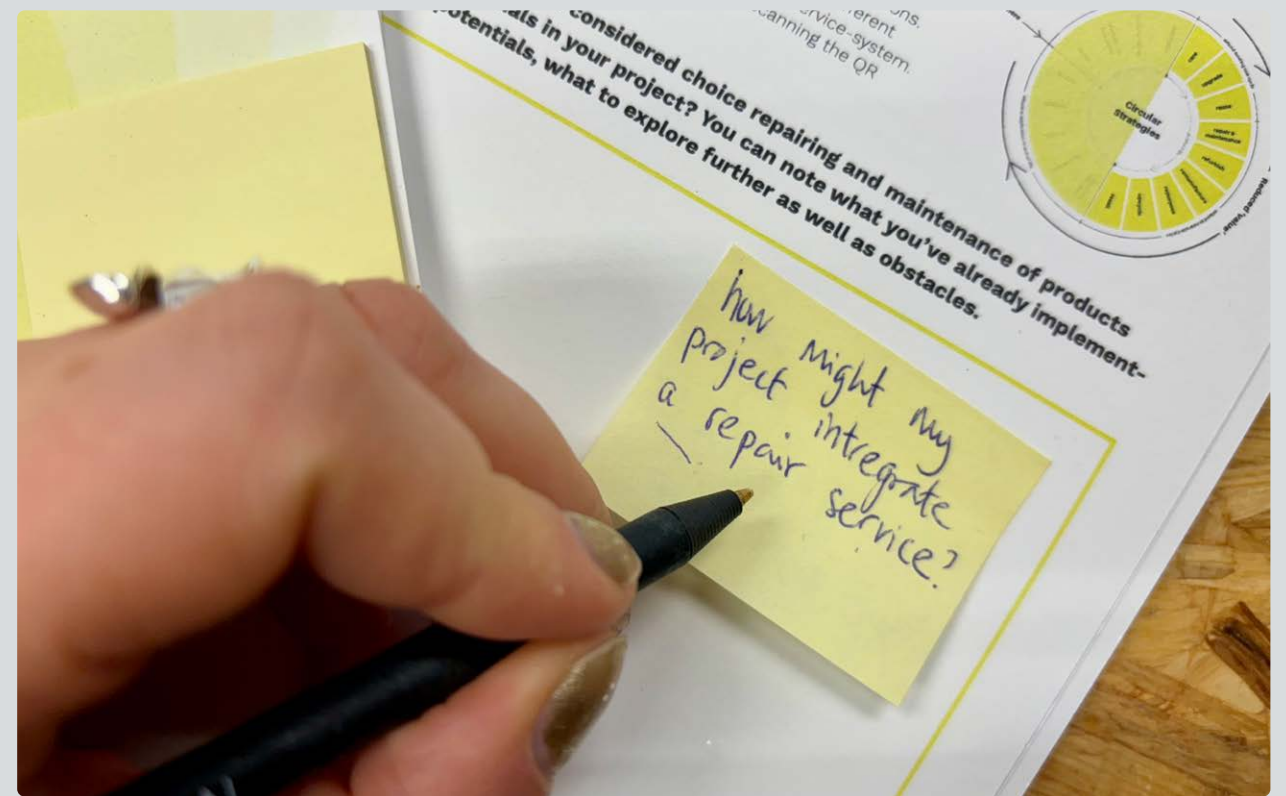


IMAGE 2. Reflections for the journal concerning the strategy 'repair' (Dec 2023, HappyLab, Vienna by Therese Balslev)

IMAGE 3. The journal in use - the makers can note, sketch and reflect upon the different circular strategies (Dec 2023, HappyLab, Vienna by Therese Balslev)

Project Reflect

Designing and building meaningful, just and joyful food experiences with communities

Project team

Angela L. McKee-Brown

Organization

Project Reflect
(www.ProjectReflect.com)

Location

Oakland, CA,
USA - North America

Project type

Client Guided Projects
& Ideation Lab

PROJECT DESCRIPTION

At Project Reflect, we seek to reframe how we value joy in the food system. We leverage a design process that centers the joy of the communities we're working with and all of the new experiences and systems we implement are rooted in expressions of this joy. Joy is a source of power for our communities — a way to connect us to one another in order to create a more just society. Every day we support people, organizations and communities in imagining what could become of the world if we centered joy when designing our food system - and then work together to build out these new worlds.

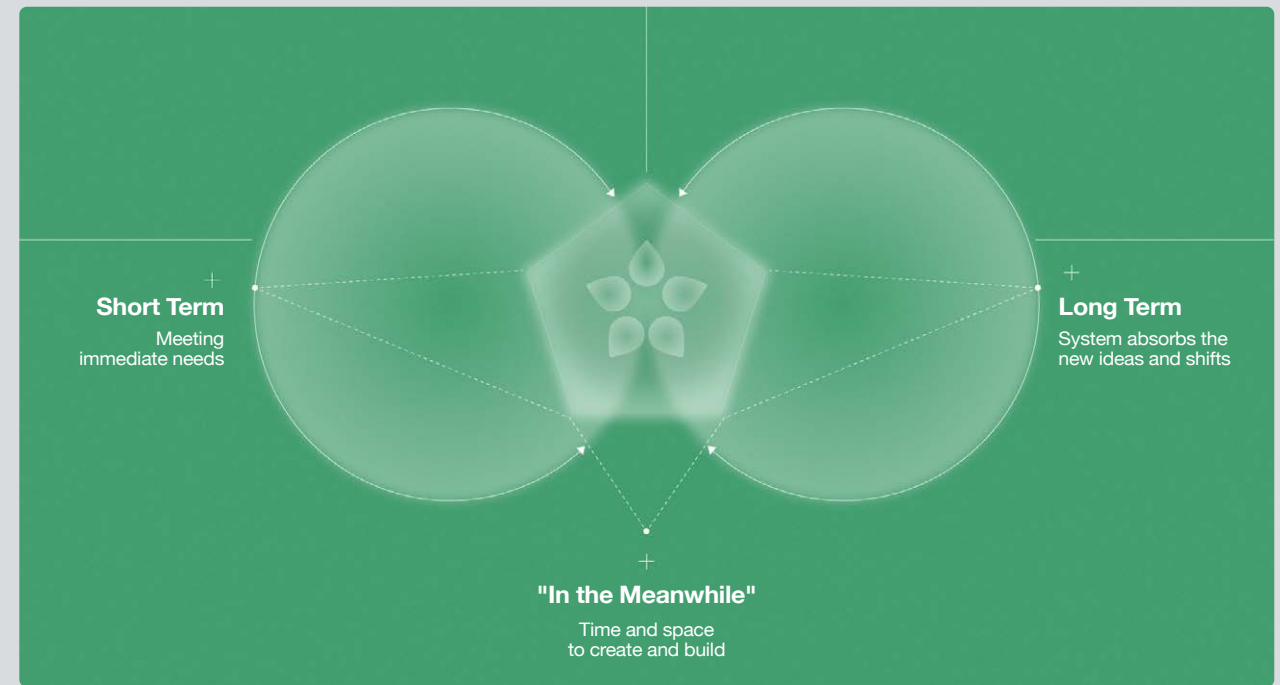
CONTEXT AND HISTORY

It all started with a period of reflection. After nearly 15 years of collaborating with organizations focused on food, the environment, and design, I took an intentional pause from work. This break provided me time and space to reflect on my career and the lessons I had learned while working with diverse communities who were creating impactful change. This reflection led to a series of questions, which ultimately resulted in the question that Project Reflect asks of each design and experience that is created: Will this provide joy or the space for joy to exist?

WHAT IS THE NEED IT TACKLES?

There is so much sorrow and suffering in the world that is produced by our policies, institutions and systems. Systemic injustice can often overwhelm our ability to feel as though we can make a difference or have an impact. At Project Reflect, we believe joy can offer a starting point and a solution for transformative change.

Joy, as defined by the Oxford Companion to Emotion and the Affective Sciences, "involves a state of positive affect, in which one experiences feelings of freedom, safety, and ease."¹ The experience of joy can provide us with a real and tangible understanding of what these concepts mean to ourselves and others. Expressions of joy and what they tell us also provides an anchor that we can check assumptions and designs to as we create and build new concepts, systems and experiences with communities.



When we design solutions that provoke joy or create space for joy to exist, we're seeking solutions that offer a sense of freedom, safety, and ease. Imagine how food experiences could change if designed to evoke joy. Consider how food policies and institutions might transform if we aspired towards a joyful society. Understanding and valuing the joy of those we design for could reshape the world.

Additionally, reflecting on our lived experiences and also confronting the history, policies, and choices that shape our current food system is crucial. I am the first generation in my family not born into state-sanctioned segregation or enslavement in the United States. A sense of freedom and safety isn't inherent in my lived experience or that of my parents, grandparents or ancestors. Policies, institutions and systems are slow changing and are often iterations of previous ways of doing - ways that enabled state sanctioned violence and discrimination. We see the fingerprints of the original designs within our current systems, and the impacts are still being felt. This is what we aim to confront and address with joyful design- and develop a new paradigm for how our society and food system functions.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Project Reflect is the synthesis of learnings and insights gained from work in the food system and design. Initially focused on client-guided projects within the food system, Project Reflect expanded its scope with the creation of the Project Reflect Lab.

Project Reflect's Lab incubates novel ideas to catapult the food system into new spaces of possibility. The Project Reflect Lab is a collective of experts with diverse experiences who are focused on developing concepts that support a meaningful, just and joyful food system. The Lab provides space for creativity, research, and learning. It was inspired by a year-long residency experience, which highlighted the immense value of taking a pause and cultivating the time and space to think. The desire to provide this same type of generative space to others, in order to unlock ideas that are desperately needed to bring about change, was why the Lab began.

IMAGE 1. Sander, D., & Scherer, K. R. (Eds.). 2009. *The Oxford companion to emotion and the affective sciences*. New York: Oxford University Press.



The foundation of Project Reflect's joyful design process are the A3C's of Systems Design, which focus designs on abundance, confidence, care and consistency. The A3Cs embody how joy is realized within systems. The A3Cs originated from learnings that were garnered from a significant project within San Francisco, California's school meal program. When reflecting on why some designs succeeded and others needed adjustment, the presence of abundance, confidence, care and consistency was crucial. This held true when I looked at other food system projects and experiences throughout my career as well. When there is abundance (enough for oneself and enough to share), confidence (trust in the design), care (intentional support), and consistency (adaptability and durability), the result is an experience that is protected and spacious, ripe for the existence of joy.

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

New ideas are being developed and seeded within organisations, and we look forward to seeing them grow into experiences that express the joy of the communities that helped develop them.

IMAGE 2. *LunchTrox, developed by the Project Reflect Lab, challenges inequities in the American school cafeteria via a simple and ubiquitous medium—the lunchbox. The thoughtful design of the LunchTrox allows for it to turn from a lunchbox into a tray - which mitigates waste and challenges norms around the lunch line. (2023. Oakland. Image created by Jane Rabanal for Project Reflect)*

IMAGE 3. *YardFruit, developed by the Project Reflect Lab, is a community-grown program that utilizes a standardized, colourful marker placed on edible plants as a welcoming signal to neighbours, indicating that it is ok to pick the food being grown. (2023. Oakland, CA. Image by Angela McKee-Brown)*



WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

I recently moderated a panel hosted by Sustainable Gastro and Nordic Talks. Speakers from around the world shared insights on how joy is a catalyst for change in their multidisciplinary work within the food system.

In her book, *Emergent Strategy*, author adrienne maree brown shares, "It is our right and responsibility to create a new world. What we pay attention to grows, so I'm thinking about how we grow what we are all imagining and creating into something large enough and solid enough that it becomes a tipping point."²

Listening to the stories shared by the panelists from around the world, it became clear that joy is inspiring change in local food systems, and could act as the tipping point for a new, collective way of being and doing nationally and globally. Project Reflect aims to amplify this and draw greater attention to the powerful change achievable when joy is placed at the center of design.

WHY IS PROJECT REFLECT DISTRIBUTED DESIGN?

Ideas developed by the Lab are shared on the website for others to be inspired by and build upon. As the Lab continues to grow, we envision creating a robust library of system change ideas, practices, and approaches. This will be a collaborative space where people from around the world can both contribute to and draw inspiration from. Additionally, the design process used by Project Reflect focuses on joy because we believe it provides a universal access point for understanding how to design for a more just and equitable future. By uplifting joy in design - and recognizing its ability to open portals to understanding what freedom, safety and ease mean for our communities- we hope to provide a tangible starting point for those who want to support meaningful systemic change but don't know where to begin.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

It would be neat to have dinner with a fruit tree. Not only would they likely have a ton of stories about the history of a place, I'd be curious what they think about and need. Over the last several years, I've begun to talk to trees as I go on my daily walks. As I pass them I ask, "How can I be of support?" I'd be curious to hear what a tree would respond. Additionally, I'm curious what a tree knows about the universe. I'm deeply inspired by *Braiding Sweetgrass* by Robin Wall Kimmerer, *Inciting Joy* by Ross Gay, *Emergent Strategy* by adrienne maree brown and the writings of Rowen White. They all speak eloquently of the rich complexity of nature above and below ground. I would love to learn more about the mysteries we still don't fully understand and a fruit tree would likely have a lot to share.

QR CODE. *Discover Project Reflect*



Pola പഠനം

Biomaterials from invasive species, water hyacinth

Project team

Nanditha Nair

Organization

Fabricademy,
Fab Lab Barcelona at IAAC

Location

Barcelona, Spain - Europe
& Kerala, India - Asia

Project type

Product

PROJECT DESCRIPTION

Water Hyacinth, scientifically known as *Eichhornia crassipes*, is known as the world's worst water weed, colonising water bodies around the globe at an explosive rate. Pola is a regenerative design method for transforming water hyacinth into bio-objects, illustrating the potential for invasive plants to be interpreted not as a nuisance but as a gift. It helps in creating local manufacturing units with the help of Fablabs to produce these biomaterials.

CONTEXT AND HISTORY

The Pola Project emerged as a response to the pressing environmental and economic issues caused by the rampant growth of water hyacinths in regions like Kerala, India. The name Pola (പൊള) comes from African Pola (ആഫ്രിക്കൻ പൊള) the word for water hyacinth in Malayalam, the language spoken in Kerala. Pola literally translates to layers.

The project's inception can be traced back to the innovator's deep concern for her community, which was adversely affected by the invasive species. Water hyacinth, known for its rapid reproduction and ability to clog waterways, damage ecosystems, and disrupt local economies, served as a catalyst for Nanditha's idea of transforming an environmental threat into a positive force for change. Nanditha's journey took her to Fabricademy, hosted by Fab Lab Barcelona at the Institute for Advanced Architecture of Catalonia (IAAC) in Barcelona, where she delved into extensive research on the potential of water hyacinth as a versatile material for sustainable biomaterial production. She continues her exploration in her hometown in Kerala, India.

WHAT IS THE NEED IT TACKLES?

Pola takes a widely perceived environmental nuisance, the water hyacinth, and turns it into a source of hope and possibility. This invasive species, considered a noxious weed in over 50 countries, possesses exceptional reproductive capabilities that enable it to dominate entire aquatic ecosystems. Under ideal conditions, a single plant can give rise to 3,000 others in just 50 days, covering an expansive area of 600 square meters within a year. Water hyacinth thrives in various environmental conditions, including toxic water.



Despite efforts to remove the invasive species, these attempts have proven largely ineffective as the plant regrows rapidly. This is attributed to its high growth rate and the ability of its seeds to remain viable for up to 28 years. The floating nature of water hyacinth allows it to spread easily across water bodies, resulting in significant disruptions to water transport systems.

The persistent presence of water hyacinth poses ongoing challenges for managing and controlling its proliferation, requiring innovative strategies and approaches to address this ecological issue. By engaging local communities, NGOs, and Fablabs in the creation of bio-objects from this invasive plant, Pola aims to heal regions affected by this invasive plant, offering new economic opportunities for those whose livelihoods have been impacted.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

The first exploration was conducted in Fabricademy in Barcelona, where research was conducted to unlock the potential of water hyacinth as a sustainable biomaterial. Nanditha Nair received mentorship from Petra Garajova and guidance from Fabricademy experts, with invaluable support from Robert Thompson Casas of Matterfad, Barcelona. The project's evolution involved meticulous processing of harvested water hyacinth stalks, including drying, powdering, and combining with specific ingredients to create bio-objects such as compressed boards, alternate leather, and cat litter. Emphasizing environmental sustainability, the project capitalized on the plant's rich cellulose, hemicellulose, and lignin content, along with its water purification properties. The ongoing efforts of the Pola project include the establishment of a manufacturing unit in collaboration with a women's self-help group, reflecting a holistic approach to address both ecological challenges and community development.

IMAGE 1. Alternate leather sheet in brown colour made from Water hyacinth. (22 March 2023, Barcelona-Spain, Petra Garajova, Copyright of Nanditha)



WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

The Pola Project is making significant strides towards its mission by establishing its first manufacturing unit near Kochi, Kerala, in collaboration with local self-government and NGOs. The project was featured in international exhibitions: Architect@Work in Milan, Future Fabrics Expo-23 in London and New York, Textile Tales at Royal Textile Academy of Bhutan, and Thriving Together in Future Cities, Spain, showcasing its innovative approach to repurposing water hyacinth into sustainable biomaterials. Notably, the project has been shortlisted for prestigious awards such as the Green Product Award-24 and Lexus Design Award India-2024. This exposure has not only generated concrete leads for Pola's products but has also sparked active inquiries, marking a pivotal step towards realizing the project's vision of transforming an environmental challenge into a catalyst for positive change.

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

The Pola project operates on a global-local relationship, embracing a distributed manufacturing model due to the widespread presence of water hyacinth worldwide. Tailoring its approach to each region, the project employs distinct recipes incorporating regional additives and manufacturing methods. This not only ensures adaptability to diverse ecosystems but also fosters the convergence of local practices onto the global sustainability stage.

The production of biomaterials from water hyacinth presents an effective model of decentralized production. Collaborating with local NGOs, Fablabs, and women's self-help groups, Pola integrates traditional craftsmanship and indigenous knowledge into its global sustainability narrative. By doing so, the project transforms a local ecological challenge, originating in Kerala, India, into a global initiative with a profound impact.

IMAGE 2. Water hyacinth is globally distributed. Native to the Amazon basin in South America, it has spread to other parts of the world. It is now found in all continents except Antarctica and is considered an invasive species in 50+ countries. (02 February 2023, Barcelona-Spain, Nanditha Nair, Copyright of Nanditha)



Open

The Pola project embodies an open and transparent approach by sharing design processes openly. Designers and researchers collaborate to make their processes replicable and accessible to regional producers. Pola provides region-specific recipes and tools, facilitating independent production of biomaterials. The use of low-tech tools enables easy replication even in remote locations. Pola's openness empowers a wider community, promoting collaboration and knowledge sharing for sustainable development.

Collaborative

The Pola project, driven by a shared vision, connects NGOs, fosters partnerships, and engages with the global Fab lab network. It actively involves citizens in the design process, fostering a sense of ownership and agency. The collaborative approach of the Pola project aims to create sustainable and economically viable communities, offering new economic opportunities and addressing the challenges posed by water hyacinth. The collaborative efforts extend to skill development, job creation, and the cultivation of a sustainable industry.

IMAGE 3. Compressed sheet made from Water Hyacinth. (22 March 2023, Barcelona-Spain, Petra Garajova, Copyright of Nanditha)

IMAGE 4. Laser cut compressed sheet made from Water Hyacinth. (22 March 2023, Barcelona-Spain, Petra Garajova, Copyright of Nanditha)

The infusion of global expertise from institutions like IAAC in Barcelona, the Royal Academy of Engineering, UK and Waag, Amsterdam, further enriches the project's approach, creating a symbiotic relationship where global insights enhance local practices, and local experiences contribute to the global discourse on sustainability. This interconnectedness ensures that the Pola project not only addresses regional ecological challenges but also contributes to a larger, more inclusive global sustainability effort.

WHY IS POLA **പൊള** DISTRIBUTED DESIGN?

As water hyacinth can be found all over the world, it serves as an abundant resource for distributed manufacturing. It bypasses the necessity for large factories or warehouses and minimizes the shipping of materials across the globe. Instead, customers can be connected to independent makers through the Pola network.

Regenerative

The Pola project, driven by a shared vision, connects NGOs, fosters partnerships, and engages with the global Fab lab network. It actively involves citizens in the design process, fostering a sense of ownership and agency. The collaborative approach of the Pola project aims to create sustainable and economically viable communities, offering new economic opportunities and addressing the challenges posed by water hyacinth. The collaborative efforts extend to skill development, job creation, and the cultivation of a sustainable industry.

Ecosystemic

Pola envisions a future that embraces disruptions and uncertainty to solve problems connected with water hyacinths. Beyond biomaterial creation, Pola adapts solutions to specific regions, fostering entrepreneurship and addressing issues from carbon footprint to health problems. The project establishes comprehensive production, marketing, and sales channels, contributing to the overall health of social and environmental systems. By setting up regional communities, Pola stimulates economic healing and positive change within the larger ecosystem, promoting sustainable practices and improving the well-being of communities and the natural environment.



IMAGE 5. Water hyacinth pulp mixed with binders to make leather. (3 March 2023, Barcelona- Spain, Nanditha Nair, Copyright of Nanditha)

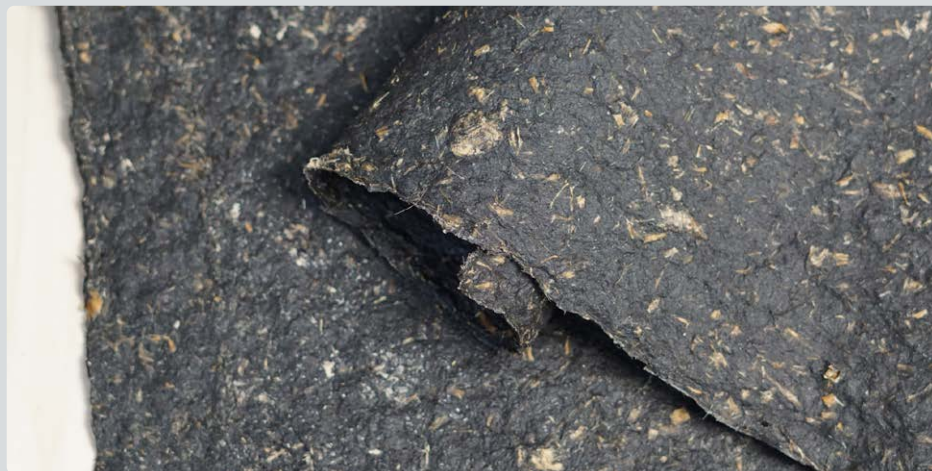


IMAGE 6. Iternate leather sheet in black colour made from Water hyacinth (22 March 2023, Barcelona- Spain, Petra Garajova, Copyright of Nanditha)

IMAGE 7. Preethi Sreevalsan and Ullas Unnikrishnan collecting Water hyacinth from a paddy field in Thrissur, India. (28 May 2023, Thrissur-Kerala, Nanditha Nair, Copyright of Nanditha)



Place

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

QR CODE. Discover Project Pola



I would like to dine with Dr. Manju Sharma, an Indian biotechnologist, who has played a pivotal role in the field of biotechnology and has been a prominent figure in India's scientific community. Her noteworthy contributions include serving as the Secretary of the Department of Biotechnology in India and being the first woman to hold this position. Dr. Sharma has been a strong advocate for the advancement of biotechnology, and has actively promoted research and development in the field. Dining with Dr. Manju Sharma could provide valuable insights into the challenges and triumphs she faced during her career, her perspectives on the future of biomaterials, and the role of women in science.

Creative Glass Serbia

Creative Glass Serbia is an initiative focused on the development of innovative creative entrepreneurship based on Serbia's glassmaking heritage through inter-connections between glass tradition, design, smart glass manufacturing and creative economy.

Project team

Hristina Mikić

Organization

Institute for Creative Entrepreneurship and Innovation

Location

Paraćin, Serbia – Europe

Project type

Product, process and service

PROJECT DESCRIPTION

Creative Glass Serbia is an initiative that connects glass tradition, creative industries, artists, designers and handmade glass production in Serbia. The initiative is focused on transformation of glass heritage into an asset for sustainable and fair local development. Inspired by Paraćin's industrial glass tradition, activities inspire and support artists, designers and creatives to develop their own cultural expressions in glass through distributed design, democratization of creative process, openness and regenerative approach in handmade glass production.

CONTEXT AND HISTORY

The oldest glass factory in Serbia was founded in 1907 in a small town of Paraćin (Serbia). It testifies to the development of glassmaking in Ex-Yugoslavia as well as in Serbia, but also to all the transformations the industry went through in the communist, then socialist system, until transition and privatization. Such an industrial past of Paraćin has a potential for the development of a local creative economy and creation of new economic opportunities for the local community.

At the same time, this heritage was burdened with negative identity (and community emotions) related to the collapse of an industrial giant, the loss of jobs and economic crisis. This glass giant was a hallmark of Serbian modernity at the beginning of the XX century, and during the socialist period, was emblematic of Yugoslavia's claim to develop workers' self-management and fast industrialization. A long-standing history of glassmaking thus became an "unwanted" heritage at the local level, a burden for the local community as it testifies to the decline of the industry and (unsuccessful) economic transition of Serbia¹.

In 2020, inspired to give this heritage a new life through the creative economy and to create decent jobs and welfare benefits for the local community, we launched the initiative Creative Glass Serbia.



IMAGE 1. Recycling of old glass created at Creative Glass Lab, work of one of the participants (2022, Paraćin, Institute for Creative Entrepreneurship and Innovation)

WHAT IS THE NEED IT TACKLES?

The initiative Creative Glass Serbia was born as a need to preserve national glassmaking heritage, diversity of cultural expression in glass, collective and individual memories and thus make it available to the wider audience, local community, artists and creatives. At the same time, the initiative is focused on using digital transformation of glass legacy as a creative space for developing different art practices and creative entrepreneurship. The two key factors that influence the handmade production of glass are energy and people. Changes in these factors led to the closure of many workshops and manufacturers throughout Europe that were engaged in the production of handmade glass and art glass works. Similar reasons led to the closure of the Paraćin factory's plant for handmade glass, so the factory now only manufactures packaging and containers.

On the other hand, the knowledge and skills of handmade glass production are passed down from generation to generation through informal means. Sometimes this knowledge is kept as a family secret and shared exclusively within the family members. That is why it is not surprising that the intergenerational transmission of this knowledge dominates in glassmaking and that with the disappearance of a generation of glassmakers, knowledge and skills also often disappear. Faced with these factors that can contribute to the disappearance and oblivion of the Paraćin's glass handmade production, the Creative Glass Serbia project was developed.



WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

We often highlight the essence of this project in one slogan 'From digitalization to revitalization,' where the development process was guided by the methodology of industrial forensics and incremental innovation.

We started with the systematization and digitization of glass products, archival materials, technical drawings, testimonies of former workers and the memorialization of community remembrance in order to make its preventive protection. The 'Vitrum' database on the platform Creative Glass Serbia (www.creativeglassserbia.com) contains more than 200 digitalized and 3D modeled glass objects and represents the largest database of digital molds for Paraćin's glass, suitable for 3D printing, production or modification. These are reconstructions of the models created in the Serbian Glass Factory from 1907 to 1980. The initiative uses a specific combination of digital humanities tools – visualisation, text analysis, storytelling, industrial forensics, animations, mapping and timelines, 3D digital prototyping, (art)coding and programming. As the digitization of glass as a reflective material is very complex and demanding, our research resulted in the creation of a unique approach of metaglass engineering which, in addition to digitalization, enables the digital transformation of traditional manual glass production and democratization of the creative process².

We also started the Creative Glass LAB, a series of open-innovation experiments with different traditional techniques of glass finishing. These allow the local community to face the traumatic emotions associated with the collapse of the factory and, innovating these techniques together with the designers, feel pride as a bearer of the glassmaking tradition and participate in the democratization of the creative processes. Through these different phases of the project, the initiative progresses towards the idea of establishing a Creative Glass Living LAB in Paraćin which would integrate all our activities in the smart industry concept of a Lab.

IMAGE 2. Creative Glass Lab 2022 in Paraćin, lab participants lead by artist Sara Masnikosa (2022, Paraćin, Institute for Creative Entrepreneurship and Innovation)

IMAGE 3. Creative Glass Lab 2022 in Paraćin, handmade work with lab participants led by REMAKE (2022, Paraćin, Institute for Creative Entrepreneurship and Innovation)

IMAGE 4. Works with old master Milan Stefanović, ex-worker of Serbian Glass Factory, Paraćin, deep engraving cuts based on full eco-creative approach (2023, Paraćin, Institute for Creative Entrepreneurship and Innovation)

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

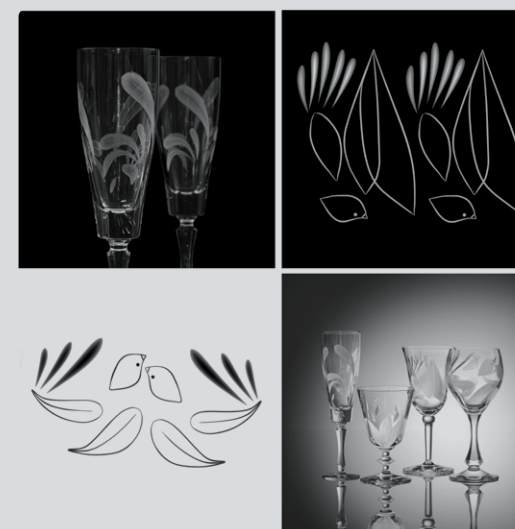
Until now, the main result of our initiative is the creation of the conceptual model of Creative Glass Lab based on "smart", digital and collaborative handmade glass manufacturing and design. Also, the initiative is focused on reducing the barriers to artists and entrepreneurs to produce glass products locally and in small production volumes.

In addition, our activities ensure healthy lives and promote well-being for the community by involving many local women (many of them worked in the Serbian Glass Factory in Paraćin) in innovative workshops for creative work with glass. They gained full access to the unique cultural content, were socially included and felt more confident.

Creative Glass LAB is strongly focused on glass circularity. Its sustainability is based on the circularity and safeguarding of traditional glassmaking techniques through digital arts, immersive experience and creative entrepreneurship. In this way, our Initiative ensures new economic and social opportunities for local people and their families.

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

Our initiative makes local glass knowledge, skills and production visible and available globally. Through our activities, we establish an intercultural dialogue between local tradition and creative practices, showing how handmade glass production from periphery places can have a universal language of art and creativity. Presenting and promoting local glass knowledge of Paraćin, our initiative contributed to the new valorization of the glass making tradition for the diversity of cultural expression in glass, especially for the decolonization of glass heritage and creative glass production. In addition, the Creative Glass LAB serves as a platform for circular solutions to local and global glass issues and employs co-creation and co-design techniques between communities and designers. The methodology of the Creative Glass LAB is adaptive to any glass community and can create synergies between local uncoded knowledge and skills and artists and designers.



WHY IS CREATIVE GLASS SERBIA DISTRIBUTED DESIGN?

The concept of distributed design is integrated within our approach that enables digital modification, manipulation, and fabrication of 3D models of glass and related digital manufacturing tools, offering to assist redesign and re-creation of new glass products. Models can be 3D printed and serve as molds for new glass pieces worldwide. That puts digital humanities and distributed design even more in the function of the revitalisation of glassmaking, and the promotion of contemporary cultural expressions in glass.

In addition, Creative Glass LAB is based on all the principles and values advocated by the distributed design discipline.



Openness and collaborative

Creative Glass LAB operates as an open innovation platform and platform for the democratisation of creative process that engages both local communities with glassmaking heritage as well as creatives, designers and artists, helping them to discover sustainable and inclusive ways of living and eco-creative working with glass as a fully recyclable material.

Regenerative & Open

Its regenerative nature is reflected in the fact that all processes are designed to minimize the environmental impact of glass production and improve the health of ecosystems. Recycle, reduce and reuse are the main principles on which the initiative has been built since its inception.

Through open innovation, LAB Designers are cooperating with the local community to create a new value of discarded glass and increase its functionality. This way, the redesign and revalorization of a single glass piece produces a carbon footprint of about 0,1 kg of carbon per kilogram of glass. In a glass factory ecosystem, disposal of these glass pieces as waste, their storage and reuse would produce a carbon footprint of about 0,9 kg of carbon per kilogram of glass, which is nine times more. In addition to that, efforts are being made to popularize and build skills in the recycling of glass through artistic approaches, raise awareness on reducing glass waste, and promote new habits that reduce environmental pollution³.

IMAGE 5. Creative Glass Lab 2022 in Paraćin, handmade work with photo foil (2022, Paraćin, Institute for Creative Entrepreneurship and Innovation)



IMAGE 6. Vintage collection „Birds and Petals“ created by Mina Miladinović, brand Koko Daš, 3D modeling and digital deep engraving cuts in combination with glass etching (2023, Paraćin, Institute for Creative Entrepreneurship and Innovation)

IMAGE 7. Creative Glass Lab 2022 in Paraćin, work with glass thermal folia (2022, Paraćin, Institute for Creative Entrepreneurship and Innovation)

QR CODE. Explore Creative Glass Serbia



IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Rony Plesl, Marvin Lipofsky, Rene Lalique, Milivoje Popović

Bagaceira Project

A research and design initiative transforming sugarcane waste into sustainable materials for the built environment

Project team

Julia Steketeer

Location

Barcelona, Spain — Europe

Project type

Research & Development

PROJECT DESCRIPTION

Bagaceira Project develops non-toxic, biodegradable products for interior architecture and design from the main byproduct of the sugarcane industry: bagasse. We source sugarcane waste from restaurants in Barcelona and have initiated partnerships with sugar refineries and industry professionals to expand our production capacity. When developing, testing, and prototyping materials and products made from bagasse, we employ a research-first approach guided by Circular Design, Green Chemistry, the New European Bauhaus and Distributed Design principles. We create high-quality products that are beautiful, useful, sustainable and promote a healthy built environment. Furthermore, we share our findings and methods with communities in sugar-producing regions through workshops and collaborative projects.

CONTEXT AND HISTORY

As governments, industries, entrepreneurs and designers embrace the Circular Economy, waste is increasingly recognised as an untapped resource. Today, material scientists and designers are developing long-lasting, high-performance, bio-based building materials and products from a wide range of agricultural wastes and natural fibres¹. These materials serve as biodegradable alternatives to petroleum-based plastics and resins, concrete and steel that generate pollutants or high carbon emissions during manufacture.

Bagaceira Project examines the potential of one of the world's most abundant agricultural byproducts—sugarcane bagasse—as a key ingredient for high-value, durable and environmentally responsible materials for architecture and interior design.

Sugarcane is the world's largest crop by production volume² and is grown in over 80 tropical and subtropical countries³. Other nations (e.g., Spain, Portugal, Italy, the UK and Romania) with little or no sugarcane cultivation, produce large amounts of bagasse in their sugarcane refineries. After the juice is pressed for sugar or ethanol production, up to one-third of the plant's mass remains as bagasse⁴. This fibrous residue is usually burnt for fuel, fed to cattle, or left to rot. However, it has great potential for bio-material development because of its global abundance, capacity for carbon capture during growth, ease of collection, low cost, chemical composition and physical properties.



“Bagaceira”, translated literally, means the pile of “bagaço”, or bagasse, left over after the extraction of sugarcane juice. In Brazil—the birthplace of this project—the word has other nuanced meanings: a wild party that goes until dawn; the rough hangover that follows; my tangled hairdo; a sticky situation or someone who is bad-ass and ready to rock n’ roll. The word is alive; it sparks emotion. Linguistic creativity transforms a simple image of a messy pile of organic trash into a variety of unexpected characters and contexts. Bagaceira Project [\[QR code 1\]](#) crafts objects that embody this transformative spirit and invites others to turn trash into treasures for the built environment.

WHAT IS THE NEED IT TACKLES?

Mountains of trash and floating islands of garbage reveal a startling truth of our Anthropocene Era: the mass of human-made materials now outweighs all the living biomass on the planet⁵. This crisis stems from a linear “take-make-waste” economy driving excessive resource consumption and environmental disruption. Conventional building materials like virgin wood, concrete, steel, and petroleum-based plastics are extracted rapidly to accommodate our growing population⁶. This unsustainable cycle threatens environmental catastrophe⁷.

According to recent studies, the construction industry makes up 40% of the total use of raw materials in the world⁸ and contributes 38% of worldwide carbon emissions⁹. Many buildings boast zero operational emissions but fail to report their “embodied carbon emissions”, generated from material manufacturing, transportation, installation, maintenance, and disposal¹⁰. Studies reveal that up to 75% of a building's CO2 emissions are embodied¹¹ and emissions associated with renovations are likely to surpass the emissions generated from a building's initial construction and must be included when calculating a building's overall impact¹².

IMAGE 1. Sugarcane Bagasse at a Processing Facility (Photo by Mailson Pignata from Adobe Stock)

Construction and interior design often rely on environmentally problematic materials sourced from virgin resources, with polluting production processes and significant CO2 emissions¹³. Additionally, waste from construction or furniture is often challenging to reuse or recycle and contributes to pollution and biodiversity disruption¹⁴. In the EU, 30% of waste comes from construction¹⁵, and the U.S. generates over 12.2 million tons of furniture waste annually, with 80% going to landfills¹⁶. In search of more eco-friendly alternatives, architects often turn to timber. However, supply challenges have led to drastic price increases¹⁷ and the projected 54% increase in global wood consumption between 2010 and 2050 poses significant deforestation and carbon emissions risks¹⁸.

There is a clear need for diverse sustainable building materials that are long-lasting, non-toxic, low-carbon and biodegradable. Agricultural waste offers eco-friendly alternatives to virgin materials, reducing reliance on timber and petroleum products¹⁹. Utilizing "agrowastes" like sugarcane bagasse can enhance farmers' and factories' income, diversify revenue sources, and cut production costs. With safe, non-toxic manufacturing processes, agricultural byproducts can be transformed into biodegradable or compostable materials that safeguard workers, building occupants, and the environment (ECHA 2024)²⁰.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

We researched sugarcane industry practices and innovations, bio-based and bagasse-based material development techniques, and potential applications of plant byproducts in the building and design sectors. We reported our findings (Steketee 2023)²¹ and created a library of 30 bagasse-based materials using natural binders such as algae, citric acid, mycelium, starches, resins and limestone. The library includes fibreboard, fiber-reinforced bioplastics, mycelium composites, and non-woven textiles. Material performance testing guided the selection of two materials for further development.

First, we selected one of our non-woven textile materials for its leather-like quality, flexibility, and water resistance. The material is made by modifying the bagasse fibers, blending them with sodium alginate, and casting them into sheets. With the material, we prototyped woven panels which could be used for room dividers, wall coverings, or cabinet doors. Second, we selected a fibreboard material made with modified bagasse, plant starches, and limestone. We moulded the material into pendant light fixtures and experimented with mineral pigments and plant dyes to achieve color variations. These prototypes represent the first stage of a longer development trajectory and will require further material testing and certification prior to market launch.



IMAGE 2. One of the eight Bagaceira material library display cases. This case displays 5 samples made with algal binders (Barcelona, 2023, Julia Steketee)



IMAGE 3. Natural pigments from plants and minerals are added to the material mixtures to achieve different colors. Photo of Lamps (Barcelona, 2023, Julia Steketee)

IMAGE 4. Bagaceira's lamps made from bagasse, plant starches and limestone (Barcelona, 2023, Julia Steketee)

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

Bagaceira Project embraces Circular Design, Green Chemistry, and the New European Bauhaus principles to ensure positive environmental and social impact. We source bagasse from Barcelona restaurants and transport it by bicycle to reduce our carbon emissions. Our materials are biodegradable and compostable. We plan to provide disposal guidance and seek certifications of biodegradability as we scale up production.

In keeping with principles of Green Chemistry (American Chemistry Society 2024)²¹, we now employ natural enzymes, instead of harsh alkaline chemicals, for the bagasse fiber modification process, reducing energy consumption and waste. Guided by the New European Bauhaus, our design philosophy prioritizes inclusivity and aesthetic appeal²². We embrace traditional craft practices and warm earthy tones and textures that connect people with nature. Our research is openly available online and complements today's growing efforts to promote regenerative design practices and benefits designers, researchers, and entrepreneurs interested in bagasse material applications. This year in Europe and Brazil, we will showcase our bagasse-based material library and detailed information about the natural binders and additives used.



IMAGE 5. This Bagaceira material display case shows several samples made from bagasse, plant starches and calcium compounds such as limestone (Barcelona, 2023, Julia Stekete)

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

The project is currently based in Barcelona but we are working to expand our team and reach by developing partnerships with non-governmental organisations, research institutes, bagasse producers and local communities in sugar-producing regions. These partnerships will enable us to set up small production facilities in sugarcane-rich regions, generating new job opportunities, diversifying income streams, and fostering pride in producing locally sourced, low-carbon, high-quality building products.

Through participatory workshops, we will teach communities in sugar-producing regions how to apply the Circular Design, Green Chemistry, the New European Bauhaus and Distributed Design principles to transform bagasse into high-value, beautiful, and environmentally responsible materials and objects. This year we will host workshops in Brazil (the largest sugarcane-producing nation); in Portugal (home to two of Europe's largest sugarcane refineries); and in Spain (where our local partners serve fresh sugarcane juice). We expect that the workshops, materials, and objects that we create will inspire our audience and collaborators to continue to further investigate and utilize bagasse and other agricultural residues for design and construction.

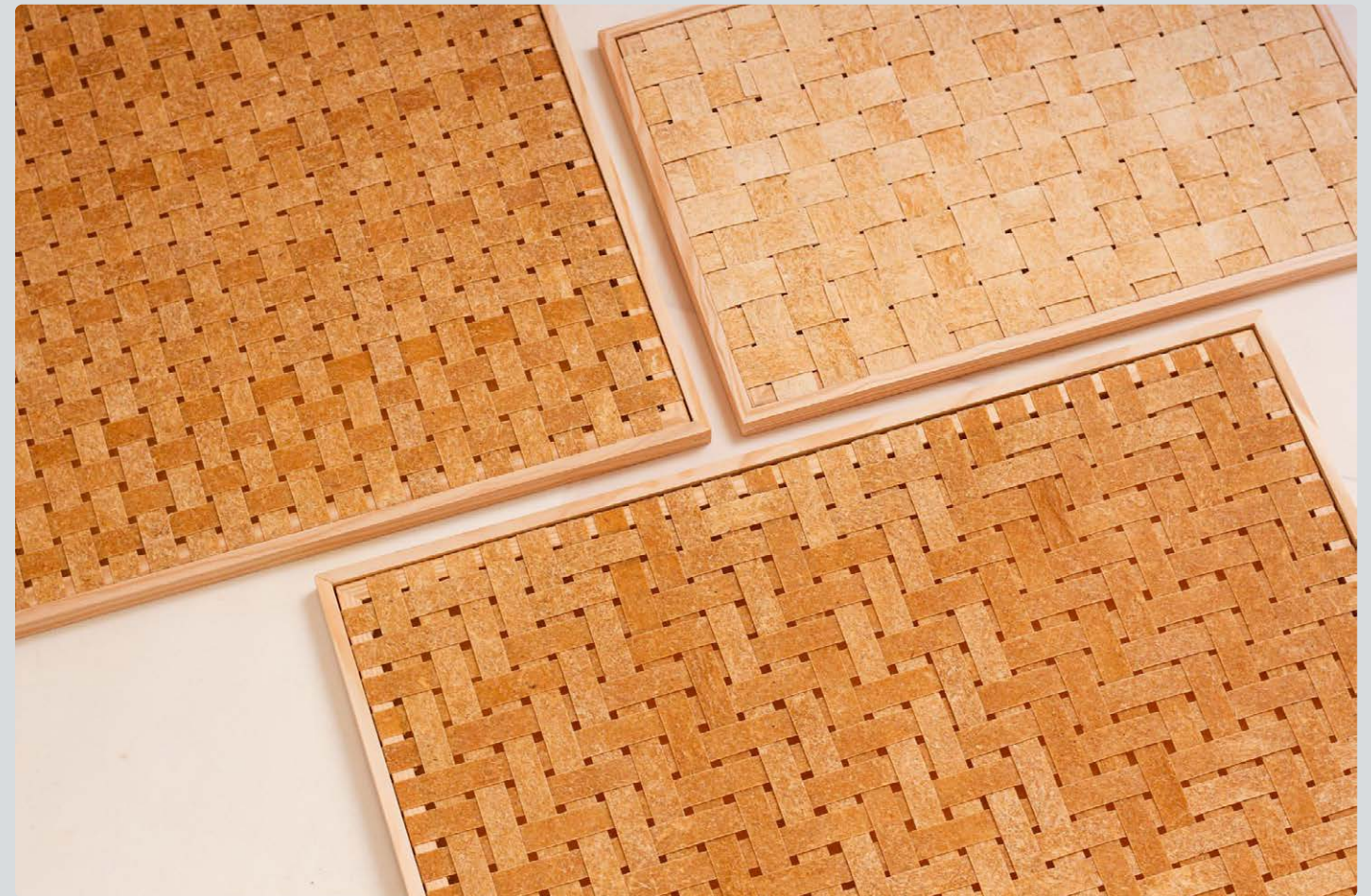


IMAGE 6. Decorative Panels woven with non-woven textile made from bagasse fibers and alginate (Barcelona, 2023, Julia Stekete)

WHY IS THE BAGACEIRA PROJECT DISTRIBUTED DESIGN?

Bagaceira creates materials and products that are sharable, scalable and adaptable to local contexts. We believe that it is important to openly share our findings and methodologies, develop and distribute educational materials and organize workshops to raise awareness about the benefits, principles, and processes of circular and bio-based design for the built environment. To this end, we have published some of our material recipes on Materiom, the online, open-source, bio-based material library that aims to accelerate the development and use of sustainable materials²³. Material designers can try out these recipes or adapt them using other plant-based waste products.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

It would be an honor to break bread with Victor Papanek, a designer and thinker who addressed the ecological and social impacts of design head-on. While his works seemed radical in the 1970s, his words now resonate with amplified relevance. His assertion, "You are responsible for what you put into the world"²⁴ has shaped our design decisions throughout the development of this project.



Bubble Trouble

Scaling Distributed Design: an exploration of challenges, strategies, and collaborative narratives from the 'Design for Impact and a Living' event

By Faezeh Mohammadi and Sara de Boer from Pakhuis de Zwijger

INTRODUCTION

Design in its broadest sense is a dynamic landscape in which the quest for distributed design principles including open, collaborative, regenerative, and ecosystemic is becoming more and more important. As a result, innovative concepts are emerging that put social values and respecting natural resources at the forefront. On November 27th, 2023 Pakhuis de Zwijger organised an event titled 'Design for Impact and a Living.' During this evening we tried to shed light on the challenges faced by innovative designers who implement distributed design principles in their work and projects. The event showcased six pioneering projects from reusing CNC machine leftovers to neurodiversity-focused design interventions each of which provided valuable insights in the field of distributed design. These projects represent a diverse spectrum of innovative approaches to sustainability. However, common challenges, such as the need for marketing expertise and overcoming obstacles in scaling production, underscore the broader obstacles faced by sustainable designers.

This review reflects on the event's main takeaway: distributed designers must break out of their bubbles to create a societal shift and a more significant impact. To mainstream open, collaborative, regenerative, and ecosystemic principles, sharing this new way of thinking with a broader audience is crucial. This not only fosters a healthy business environment for designers but also contributes to the necessary transition to an economy respecting social and ecological boundaries.

This text is based on a review of the event and reflects on presentations and discussions from participating designers and experts in the field. Only some of the speakers are mentioned in this article. Direct quotes are not used: instead, speaker ideas are summarised and shared.



IMAGE 1. *SFeel Refill is a seating and storage piece created by the Distributed Design duo Maria Levitskaya & Daniil Chechin. Photo by Feel Refill*



What are the troubles?

Elaborating on the challenges of distributed design, in the following paragraphs we unravel the intricacies of upscaling sustainability and the important role of effective storytelling. In the upcoming exploration, we delve into the balance between sustainable principles and scalability, along with the power of narrative in the digital realm.

Upscaling sustainably

One of the main challenges that designers struggle with is upscaling and growing their projects while staying true to sustainable and distributed principles. Growing from a small scale initiative to a project where one can make a living. This causes a paradox in wanting to make and sell more products, while on the other hand wanting to have a positive impact. Or at least make less impact while producing and using essential tools in life. Also energy usage to make products, the impact of logistics and the use of raw materials are subject for discussion.

Davide Onestini, designer at Post Paper Studio and an influential figure in the design community, articulated the core issue: the industry's heavy reliance on fossil fuels. High-tech, high-energy solutions, often considered progress, aren't necessarily proof-ready. Fancy, high-energy solutions aren't always ready for action. Instead, a shift towards low-tech, low-energy solutions is advocated, aligning with principles of sustainability, accessibility, and self-sufficiency. In other words, he pledged for a radical shift in both consumers' and designers' way of thinking about how we produce things. This mainly challenges the belief that technological progress and sustainability are inseparable companions. Davide rightly points out that many contemporary technologies aim to fix the problems caused by older ones.

IMAGE 2. *Furniture created as part of the project, Found Objects, by distributed designers, Inigo Puerta & Paola Zanchetta. Photo by Found Objects*

IMAGE 3. *Inclusive Club Collective founder Daisy Dawson leads a workshop. Photo by Anwyn Howarth*



Effective storytelling

The article suggests that communication might be a big bottleneck, urging for collaborations that address this comprehensively. The importance of storytelling as an effective tool in design is evident. In the face of challenges, designers emphasise effective communication as a catalyst for change. Meaning that people that use or buy your product or service need to understand the underlying principles, without making it too theoretical. Do you attract someone by explaining your design is open source? Or by sharing that your design is beautiful and/or useful? And if we do not say the values underlying a design, will we change the mindsets of the ones buying it?

Guest speaker Rosa Kieft, head of Innovation Programme at What Design Can Do (WDCD) stresses the need for designers to leverage storytelling skills, shifting the focus from problems to the positive aspects of the future of design. This aligns with the concept of a 'flexible story,' recognizing diverse individuals and groups. She suggests having different stories for different groups, understanding that not everyone is in the same phase of understanding. Crafting narratives tailored for different groups becomes imperative in engaging a broad audience effectively. Kieft puts it in words well – the challenge is not in convincing designers but in telling the story to a wider audience. This underlines the importance of storytelling and showcasing the positive impacts of distributed design.

HOW CAN WE BURST THE DESIGN BUBBLE?

In the realm of distributed design, breaking free from conventional boundaries is essential. The speakers and the designers during the event reflected on different ways to burst the design bubble. In the following paragraphs we navigate these perspectives including transcending limits through collaboration beyond boundaries, Innovative approaches to financing, and the global call for systemic change.



Collaboration beyond boundaries

During the programme, speakers emphasised the importance of breaking out of the design bubble through collaboration. Doing so is essential for designers to make a societal shift and a more significant impact. Rosa Kieft's focused on collaboration beyond the design field. Engaging with professionals from diverse backgrounds fosters a cross-disciplinary dialogue contributing to comprehensive and sustainable solutions. For example, we should involve policymakers, knowledge institutions, and teachers in a new way of designing. But also include other sectors, where changes can be made like education, the cultural sector, the hotel industry, etc.

WHAT ARE THE STRATEGIES?

To overcome the challenges that speakers and designers highlighted during the evening, and that are addressed in this review, we expand on strategies to overcome obstacles in distributed design projects. Below, we give an overview of strategies designers might take to sustainably upscale, navigate common challenges, and create collaborative narratives and future visions.

IMAGE 4. Samples from Post Paper Studio, the project by distributed design collective By the End of May, comprised of Davide Onestini and André Trindade. Photo by Post Paper Studio

Innovative approaches to financing

Within the design community, we have heard this many times that financing collaborative efforts to scale up distributed design remains a crucial challenge for designers. Kaye Symington, one of the speakers at the event, reflects on that during the programme. Kaye is a freelance marketing and community consultant. Currently, she is also part of Kickstarter, a platform where they help creative projects come to life. Her pragmatic perspective urges designers to be innovative and strategic in defining goals and mapping out costs for survival. This includes exploring new ways of making money and emphasizing that financial sustainability is as crucial as ecological sustainability. Working towards a new economy is needed in the long term, where taking care of the earth is worth more than growth. In the meantime, it is necessary to make your business model work. Rosa Kieft additionally mentioned that different funds on national, European or global levels could help. Crowdfunding or pre-registrations are also a way of funding and starting a new project.

The global call for systemic change

The need for systemic change has been discussed widely and its importance in design thinking is evident. During the evening, Daisy Dawson, social designer, and inclusivity activist, introduces a crucial perspective, pointing out the need for systemic change on a global scale. The narrative often portrays designers against the system, but what if the system itself aligns with designers? What if the system supports the designers? The idea of in-house designers within businesses and governments emerges as a potential catalyst for change, influencing policies and practices from within.

Strategies for sustainable upscaling

Among all, practical strategies are centered on navigating the complexities of distributed upscaling, including early engagement with collaborators, strategic goal-setting, cost mapping, and finding creative ways to make money. Additionally, advocating for in-house designers within companies and governments is recommended. This move aims to align designers and institutions with shared goals, steering them away from being adversaries within the current economic system.

Strategies for navigating common challenges

The emphasis is on building collaborative communities, establishing robust marketing strategies, and using innovative methods for scaling production. Insights from experienced designers and industry experts shed light on the practical steps designers can take to navigate these challenges successfully. The first and foremost strategy is effective communication and collaboration. While many different and rich insights

emerged from the discussion in the event, one of the most important ones is developing a comprehensive design system that includes standardized yet flexible processes to follow. Resource allocation and workload distribution is another crucial strategy to be considered. Last but not least, focuses on adapting to technological changes to encourage continuous learning and provide training and resources to the distributed design community.

Collaborative narratives and future visions

Above, we've explored the power of collaborative narratives in shaping the future of distributed design. Drawing on the insights of designers who advocate for breaking out of the design bubble, we reflect on the potential of shared narratives to create a societal shift. By making open, collaborative, regenerative, and ecosystemic principles more 'mainstream,' designers can contribute not only to a healthy business environment but also to the broader transition towards an economy that respects social and ecological boundaries.

CONCLUSION

The challenges of upscaling sustainable design within the framework of distributed design are nuanced, multifaceted, and interconnected and therefore demand our collective attention and collaboration. As we navigate maintaining sustainability while pursuing scalability and grapple with the importance of effective communication and visionary storytelling, there remains a strong need to continue exploring these challenges to find potential responses. This review, therefore, extends an invitation to the design community to engage in a shared journey towards a more ecologically conscious and collaborative future. The narrative of sustainable design is dynamic and evolving, and it is through the collective endeavors of designers, collaborators, and a diverse audience that its true potential will be realized. Let us come together, explore these challenges, and co-create innovative solutions to support the distributed design community in its pursuit of sustainability.

Reimagining the Archive and Commoning Practices

A conversation departs from Alchemy of Commons and Liquid Dependencies

By Aiwen Yin from Stichting NextKin and Mengyang (Zoe) Zhao from the University of California, Santa Cruz

Alchemy of Commons (hereafter AICo) is an evolving gamification-as-research project aiming to design and simulate a new socio-economic system to sufficiently support communal practices and socially engaged art at large. Meanwhile, it represents an ongoing collaborative and transdisciplinary effort to archive the variety of commoning practices in the Majority World.

Based on the experience of Dinghaiqiao Mutual-aid Society (2014-2021, hereafter DMaS), a renowned intentional community located in the working-class neighbourhood Dinghaiqiao, AICo develops a series of theoretical frameworks that captures the ontology of community and the broader survival concerns thereof. As a role-playing board game in its current form, it features the phase of the 'Co-op Plan'Om (2018-2021) when DMaS transitions from an artist-led initiative to a self-government community. Guided by each DMaS member's life story unfolding alongside societal changes, the players collaborate to keep the community alive and meaningful to society while making sure their personal needs are met between the communal life and their personal life.

In this article, Aiwen Yin - designer, researcher and co-creator of AICo will converse with Zoe Zhao, an activist-scholar and a consultant for AICo. They discuss the archival urgency of communal practice, gamification of commoning practices, and the social implication of AICo in the era of (in)mobility. Yin and Zhao have previously collaborated on 'Liquid Dependencies: What does a decentralised caring society look like?' along with Yiren Zhao, an educator and community organiser, who is also a long-term participant-in-resident of DMaS and the initiator of the 'Co-op Plan'. Currently, Yin and Y. Zhao are currently the main researchers and game developers for AICo.

THE ARCHIVAL URGENCY OF SOCIALLY ENGAGED ART AND INTENTIONAL COMMUNITIES

Aiwen Yin (hereafter A): The archival potential of AICo was a bit accidental. AICo was designed as a simulation system to model an alternative art economy that can properly support socially engaged art. My preparatory research before AICo was focused on the structural discomfort of the practice in the general art economy, which is organized around object-based art collections, time-bound exhibitions and lonesome artist profiles. Socially engaged art is largely process-driven, collectively produced, situated and open-ended. It's bound to be a perennial struggle for artist-collectives who wish to be recognized by the art world but still want to stay somehow truthful to the practice. The idea was to imagine a completely different art economy that is organized around the logic and the needs of socially engaged art, how would it look like?

When I began sketching the system, the necessity to have case studies to stimulate became apparent. As I was already working with you and Yiren for the role-playing game Liquid Dependencie¹, and got to know the members of Dinghaiqiao Mutual-aid Society (hereafter DMaS) quite closely, I thought using DMaS as the first case study would be a good idea. Not only because we already have shared ethics, complimentary working methodologies and a pre-established trusting relationship, DMaS in general is a very special collective that survives all the typical community crises and still ends up with a happy closure. I wonder what is their secrets and what the AC system can learn from their experience. Anyway, while writing proposals and thinking about what kind of grant opportunities we can fit, I somehow realized we could pitch "playable scripts" as an interactive, embodied archival method

for socially engaged art and communal practices. Yiren, as a long-term participant of DMaS who also received a lot of requests to study and document the collective's practices, was surprisingly excited about this potential. Because monologic text and documentation often feel inadequate for the process-driven and embodied nature of socially engaged art and communal practices. An immersive role-playing game seems structurally appropriate, and so we began.

Zoe Zhao: It is also great timing for AICo to combine gamification and archiving. Historically, archiving has been an essential practice for feminist, queer and trans survival and activism for decades^{2,3,4}. In the last three years, there's been a notable expansion in both the volume and diversity of archival and data justice initiatives, a growth spurred by the urgent need for pandemic-era organizing and mutual aid. This resurgence in archival activism has inspired AICo to integrate these practices into the socially engaged arts sector, where archives are often monopolized, tokenized and dematerialized by white boxes. Meanwhile, I can see it critically deepens the dialogue through gamification-as-research, a novel method to produce dynamic, "living" archives for commoning practices. In AICo's case, archival activism crystalizes into a role-playing game that documents each member's participatory trajectory and the collective's embedded social milieu, which was made possible through pre-existing coliving and coworking relationships and months of in-depth interviews during the later research time. To us, it serves as an immersive, embodied method of both making archives and creating new actionable futures.

Aiwen Yin: Speaking of queer archival practice, I recently went to Bogata and met Chilean artist Felipe Rivas San Martín. He uses AI generative images to create a would-have-been Latin American queer archive in the early 20th century. The archive is quite life-like except for the famous hand problem⁵ that gives away the identity of the creative laborer behind it. The work itself definitely falls into the category of archival activism, but it also induces questions regarding the production of archives. What kind of "truth" does an artificial archive represent here, how do we understand such archival activism that attempts to make the invisible visible through a semi-manufactured archive? I say it's semi-manufactured because the database behind the generative images is real, although very likely coming from other unrelated sources. Before I link this question back to the archival attempt in AICo, I am curious how you see this complicated relationship between the unarchivable and the fictional archive through AI technology.

ZZ: I also witnessed the growing usage of GenAI-generated content in visual activism on platforms such as Instagram and the backlash against the unethical use of GenAI images for political mobilization⁶.

However, it is unclear whether these techniques would reproduce hierarchies in alternative archives and counter-info sites. It's important to note that, from procedural generation to hacking tools, AI has been intertwined with game design for a long time, well before the controversies surrounding tools like MidJourney and Stable Diffusion emerged. Simultaneously, there is also increasing evidence of the servitization of the game industry⁷ under which more human moderation and care labor was absorbed into the sector. The creation of AICo, although not a video game yet, seems to bolster this human-centered approach instead of the AI hype. It involves extensive labor of talking to each member, triangulating perspectives, distilling mechanisms, self-reflection, and all kinds of back and forth, which also builds upon previous onsite trusting bonds.

AY: I think the artist's attempt was interesting enough to check the question of the hierarchy of (re) production. Let's say if there is, the problem might be more of a geopolitical one? Because he was asking the AI to produce footage of queer people in a society that would've never archived them. That means the generative images are most likely taken from the relational images from other societies and patched with certain racial appearances. I guess I don't know AI generative images enough, but I was almost about to say colonial as well, I am just not sure who colonized whom in this case.

If we were talking about moderation labor, I think Liquid Dependencies were way more radical, in the sense that it heavily relies on multiple hosts to collaborate closely together. AICo's hosting is quite easy so far (although we are still developing), or maybe it's more decentralized because the players basically host themselves after they get through the first round. And the game is so heavily relying on players' psychological interpretation to transform quantitative data into qualitative data, I find it quite radical somehow. And it works really well with the subject we are exploring - how community is a complex between objective happening and psychological projection.

ZZ: Your responses prompt me to think about the ethics of archiving. Since AICo players often have prior commoning experience, they bring their own stories and framing of group dynamics to the gaming process. How does this prior commoning knowledge and players' agency impact the ways these living archives are organized, remembered and incorporated into later game versions?

AY: Definitely. Players in our test-playing certainly use role-playing to vent many concerns and frustrations that they obviously kept inside in previous practices. The surprising part is that we realize how these plots and patterns are widely shared across communities between China and Europe (where the test players came from so far), that it is more than convenient that the players find a suitable in-game



event to spill out their past communal experience. One of the players, who is a committed curator of commoning practice, even lashed out saying that communities are the most violent places they ever experienced, at the end of the reflection. It was not a denial of the importance and value of these practices; otherwise, they wouldn't commit their entire professional life to it. Instead, it exposes the real challenges inside communal practices that they hardly find an appropriate and understanding place to speak about – until the reflection moment of our game.

Having said that, the other side of this player practice can pose questions around the responsibility of archiving -- should we correct players with the "correct" happening in the archived community, despite a role-playing game (instead of a traditional scripted theatre) encouraging players to have their own interpretation, even invent their own storyline. In other words, would the playfulness and freedom of the players comprise the authentic representation of the archived community?

I wonder how you would approach archival ethics in relation to these scenarios.

ZZ. I would not perceive players' own narration and alterations as a deviation from or interference with the "original" story. There is, of course, contention between different versions of gameplay. But I would be very cautious about the fixation with adhering to the "original stories." Even in hindsight, there is always the possibility that DMAS would embark on a similar journey as the actual gameplay, should its members opt for a different approach when previous episodes unfolded. To use the concept of other game researchers, I view it as a healthy "narrative agency"⁸ that sparks multiple potentialities of the community by extending beyond the original narrative and encompassing even those outcomes that might be deemed undesirable. Moreover, in my own experience and through conversations with community members, we often encountered uncertainty and ambivalence about our decisions. DMAS members might also choose a different path in their game testing. This suggests that AICo could benefit from incorporating players' archival activities to more directly reflect this uncertainty.

IMAGE 1. *Between past and future - a road in Kalentzi, Greece (September 8, Kalentzi, Greece. Leo Stillingner.)*

AY. I agree with you. The "parallel universe" effect was one of the most interesting "selling points" to people when we first pitched the role-playing game as an archival attempt. I guess I am still pondering about the definition - or the general expectation - of an archive, which is a site to allows people to revisit what happened. The interesting thing about AICo is that people can revisit what happened to the members, what happened to the environment they reside in, and the major events that the collective produces. Everything else is the player's collaborative speculation that materializes through different interactive patterns we present as "interaction cards". By the way, these interaction cards are also part of the archive. Based on our interviews with DMaS members, we produced interaction cards like "cooking," "community hangouts," "keeping the group chats alive," and so on. They definitely help players to recreate some of the community dynamics in the game. But we also notice that DMaS was very good at the relational and maintaining activities, and not as quite so in the economic part. As a result, we have very few interaction cards that point to the economic axis of the community's ontology. I wonder how you see this problem - should we add more interaction cards that DMaS was not considered or even capable of, due to the stage of life that the members were in?

ZZ. To go back to your point of commonality between communities across continents, I have found similar patterns of resonance between seemingly distinct collectives in North America. On the one hand, it was encouraging to learn these communities could generate similar reflections even under quite differing social-political settings, but on the other hand, it can also be alarming to realize that patterns of exclusion and marginalization are so ingrained and universal. It also perhaps implies that players are more likely to project their lingering frustrations and trauma into AICo gameplay because these effects are less likely than joy and achievement to be sealed in the official history, which could pose another archiving challenge. Do we need to over-sample traumas and setbacks to counter the prevailing history?

While we are really fortunate to feature DMaS in the archive because, typically, such stories and individual psyches are buried when a collective ends, we still have the issue of not being able to connect with every member of the community, especially those who departed early amid controversies. I wonder whether and how the game development could to some degree mitigate the dilemma and how players creatively work around the low representation of specific members and plots.

AY. Indeed. What we did so far was to portray departed members in the playable member character's story, but it will be limited to that character's perspective. As you said, these departed members usually left because of controversies, and

sometimes even the remaining members wouldn't want to talk about the controversies, as they might be implicated in the incidents. So it gets very complicated to document these issues that are in fact made a huge impact on the community.

In the current version, we only vaguely write about these situations and focus on the psychological impact or aftermath of the incidents. This gives some puzzle-solving feelings to the players. But since players always assume all mentioned characters are playing on-site, they sometimes create completely off-the-rail connections between characters. So far it's been quite fun to watch, but I am still not sure what it means to the archival side of the game. It doesn't feel like just a player's interpretation issue, rather, it feels like a structural thing.

As well, failed patterns are as equally important to study as successful patterns like DMaS. In fact, DMaS was, in many ways, a "simple" community to study. All members are Han Chinese and share similar socio-economic backgrounds. They are all well-educated and are in a similar stage of life when they join the community. All of these would make the barriers to communicating and connecting much lower than, let's say, intentional communities in the US that typically counter complex socio-cultural differences. Even if so, not everyone we interviewed wants all their relevant life experience to be archived. Not to mention some of our important analyses will also have a hard time getting into the archive because we don't think the members would like to be seen by the public that way. I think we are trying to balance a little bit between our archival impulse with the respect of how people want to be documented. Some people might find it a pity that we cannot write everything we have seen and learned, but perhaps that's part of the innovative job we are trying to do here. An archival method that is deeply involved with the community, and hence the compromise is part of the process and result.

GAMIFICATION OF ACTIVIST EXPERIENCES

ZZ. Over the years, during my research and teaching of media activism, I have encountered dozens of gamification projects for social justice and public education. Many of these projects utilize gamification as a way to summarize and streamline findings from existing academic and policy research. Some justice-oriented online games are even developed by outsourced teams, so they often adopt similar game mechanisms, with point-based simulation games being the most common model. My understanding is that AICo goes beyond viewing gamification as just an add-on feature of social justice initiatives. There hasn't been systematic research on

the commoning practices we're focusing on, so we don't have a comprehensive body of content to draw from. This gap in prior engagement has led us to take on dual roles as both developers of the archive and the game.

AY. Indeed, unlike Liquid Dependencies works as a simulation and storytelling machine for ReUnion Network, a well-developed abstract system, AICo began only with the problems of the art economy and the struggles of socially-engaged art. There wasn't a system ready to translate, instead, we relied on case studies to figure out what the system should look like. So Yiren and I spent about six months diving deep into her experience in DMaS and interviewing other members. And we distil the empirical study into something more mechanical that has systematic potential.

Here the gamification-as-research methodology forces us to make sure our findings can be transformed constructively. Because player agency is crucial for the playability of the game. If players are only walking through the predesigned narrative, then it would be less of a game than a click-through movie. Being able to make decisions and change the status quo is important for people to feel they have a place in the future-making of the game. And that "feeling" is an important message for both games (Liquid Dependencies and AICo) we have developed so far. We don't want to just study what happens and make it fun for people to learn. We want to learn from the overlooked past (such as informal care between non-kin relationships in Liquid Dependencies, and the internal needs inside intentional communities in AICo) and make a constructive proposal to organize differently. To do so, we also need to make a balance between functioning guidance, so that people won't get lost in the game, and space to explore and even to disrupt. So that we can actually learn from each game session and test out assumptions for the new art economy to be built. This kind of demands further force us to go beyond empirical research and critical discourses, and make the game a venue for constructive reflections and actionable futures.

ZZ. I also find many AICo game mechanisms extremely intriguing. Notable among them are the rules of "progress or regress," and "polarization collapse," which encourage players to balance different dimensions of the collective. I am curious to learn more about the definition of what counts as progress in AICo. Is progress not necessarily event-driven? Or what is an event or eventful moment for a socially engaged arts community? For instance, does a collective dinner have the same weight as holding a panel discussion? I believe this is also crucial for the broader discussion of activism and feminist practices, as traditional social movement studies often conceptualize events as protests and revolutions, lacking subtler documentation of everyday uneventful politics and thriving.

AY. We definitely see communal events beyond public-facing activities. In fact, activity is only one category out of the current six types of interaction cards we made. Other types include documentation (documenting, archiving, making social media posts and publications), maintenance (house cleaning, paying rent, groceries, keeping the group chats alive, etc.), relationship (checking in with members, organizing dinners, supporting members, etc.), wetlands (cultivate connections outside of the community) and explore (find new storytelling leads outside of the main plots). These categories are designed as a guideline for players to have discussions, but as mentioned, they are also part of the archive of what DMaS did to cultivate their collectivity.

In terms of progress, it's more "measured" by what we call the ontology of community. There are five axes -- Space, Relationship, Labour, Economy and Healing -- that define the status of a community. Each axis has two opposing aspects of the same quality, such as the Space axis contains Safe Space and Open Space, the Economy is made of Community Economy and General Economy, and Healing considers Individual Nurturing and Social Healing. As you can see in the circle chart we made to show the ontology, the lower half is generally more internal and of a maintenance nature, and the upper half is more public-oriented and requires more labour that is traditionally recognized as productive.

"Progress or regress" points to the reality that all of these aspects require constant maintenance. For instance, relationships require a comparable frequency of engagement to stay active and be ready for exchange. It's not that if the interactions fizzle out then the relationship will become bad, but it will need a lot of work to warm up again. In this sense, the "progress or regress" is pointing toward the community's ability to mobilize their community and their environment. And in making this game, we do advocate the idea that feminist practices need to be an integral part of intentional communities.

ZZ. The interplay between individual agency and collective goals presents a second intriguing issue. The game's design, which allows for three distinct personal senses to be mapped onto a collective framework, subtly acknowledges that personal achievements may not always align with the group's progress and goals. I'm curious if the game permits players to contribute only a portion of their tokens, or if they can choose not to contribute at all to the collective board in the end. DMaS might be a more



inclusive and caring community that most players are willing to contribute to. However, how shall the game contemplate scenarios where players might find personal fulfilment without fully engaging with a collective identity? This echoes my research on diaspora activists who, feeling disillusioned or alienated, may spend years searching for a community they're ready to embrace fully. Before that, often transition between different groups, drawing lessons from each encounter with failure and conflict, and keeping a personal distance from the collective's gains.

AY. Recently we did add a new rule that allows people to trade two tokens of the same sense to improve their life status by one point. And the traded tokens won't be able to map onto collective commons. This rule creates the narrative possibility that individuals may either have to consider their own well-being and growth trajectories outside of the community, or they simply consider the communal achievement as evidence of their own excellence instead of a collective effort. Both scenarios can happen in real life. Both show the struggles between personal development and communal practices in a society that forefront individual achievement.

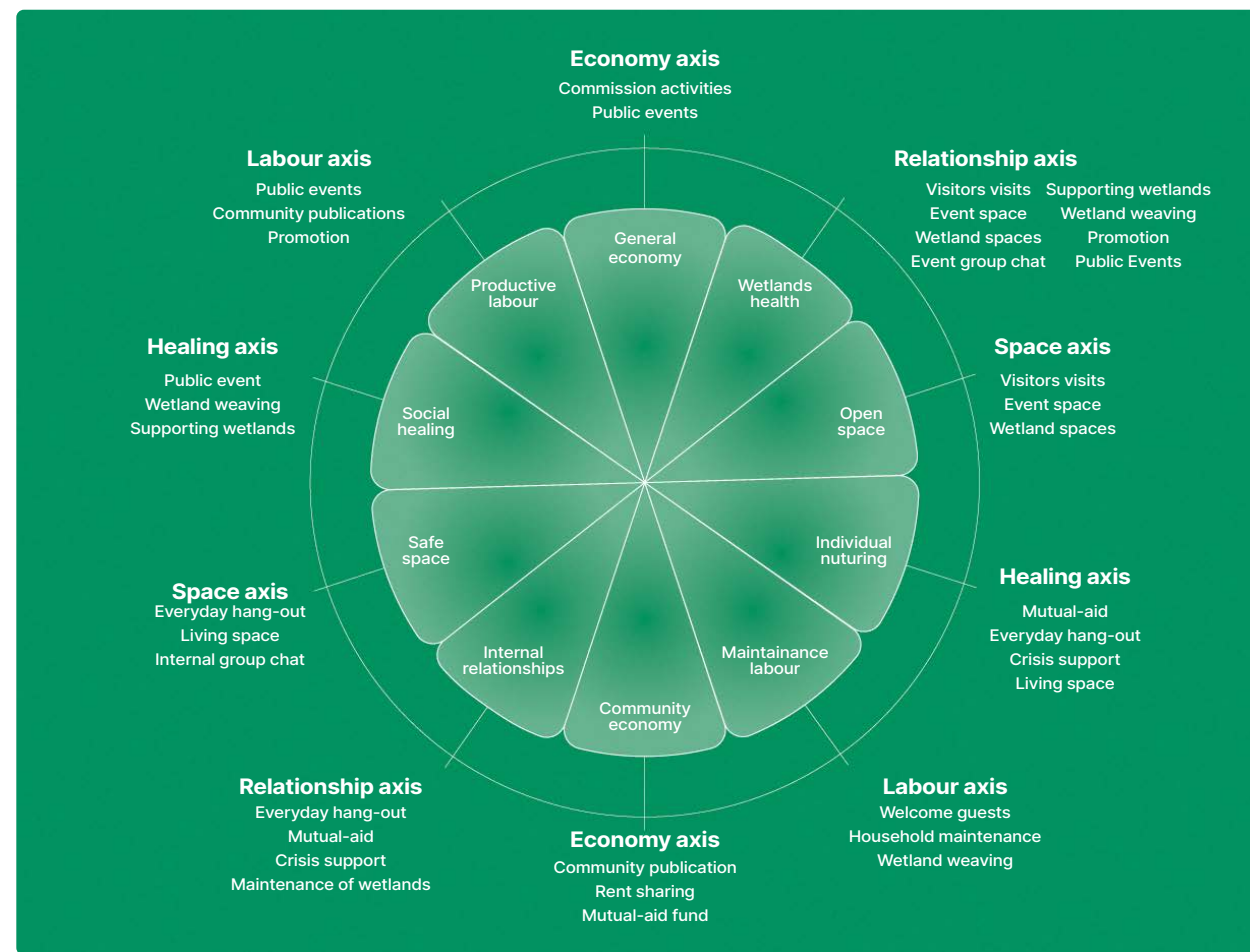
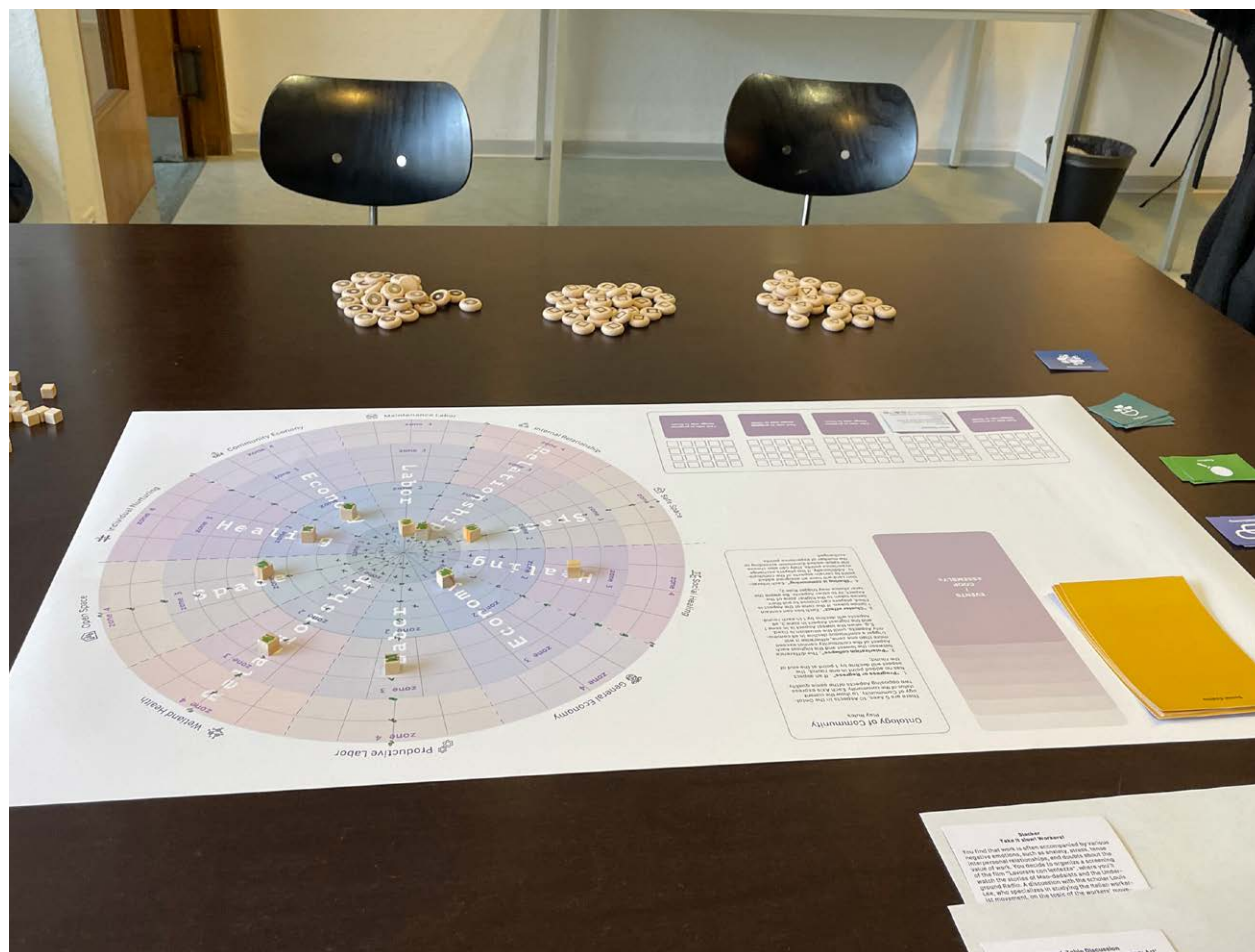
The problem I see in the game is not necessarily conditioned by the affordance of DMaS' communal story, but the game mechanism itself. As the main

game board is focused on the ontology of the community, there are few incentives for players to consider options outside of the community, unless their personal situation becomes quite severe. We have seen this situation in Liquid Dependencies before, community-oriented players will disregard their own well-being as they are pursuing collective success. Only Liquid Dependencies didn't set any winning or losing points for the community, so we can discuss the player's values and choices. But for AICo, it's been quite constructed and we don't want the game to encourage people to get burned out for communities. However, if we make too many options outside of the community, the game might lose focus and create playability questions. I wonder what your thoughts are?

ZZ. Considering the frequent occurrence of burnout and retreat in creative and activist communities, the newly introduced rule appears to be a promising way to achieve balance. I agree probably few players will actually use it, especially in light of the goal of the game and DMaS's own happy ending. It might also be beneficial to include members' burnout experiences in other settings. At least for DMaS, a few members joined or maintained connections with it mainly because they got burned out in other networks.

AY. Totally. In fact, thanks to these members, we get to compare what DMaS did right or what DMaS was lucky to dodge the bullet. Only with these comparisons, can we build a framework that can explain different types of collectives and even NGO communities. And funny enough, it is through this framework, we get to understand further how incredible DMaS' work has been. As I mentioned

IMAGE 1. Between past and future - a road in Kalentzi, Greece (September 8, Kalentzi, Greece. Leo Stillingner.)



previously, almost no DMaS member thinks their community is dramatic enough to be scripted, but through the framework, we understand it's completely the opposite: DMaS went through all the typical crises of a Chinese community and intentional community in general, but their philosophy tends to turn crisis into a moment of reflection and evolution, and so it became somehow uneventful. This may lead to an interesting speculation: does all community drama somehow expose the lack of internal resilience, other than a misfortune or the limitation of humanity?

ZZ. Another issue I would like to discuss is the sense of urgency and time scarcity during gameplay. Various game mechanisms seem to instill a sense of urgency. For instance, many players have a negative starting point for their "three senses," which is quite rare for game design. Moreover, they are thrust into a crisis scenario with the DMaS from the outset, with one dimension nearing 0, necessitating everyone's swift action. The "progress or regress" mechanic mentioned before reinforces this pressure. Additionally, each round's brief ten-minute window for free activity adds to the intensity. Could you elaborate on the choice of creating this urgency and whether it results from previous game testing?

AY. It's very intriguing how you describe this game situation. The urgency you describe was half-research outcome and half-playability design. When we started the interview and preparatory research, many DMaS members mentioned that they were sceptical about the gamification of DMaS, since the collective experience was so everyday and seemingly uneventful. But since gamification was only a means to research a new art economy, we didn't choose DMaS based on the level of drama that most role-playing games would look for. Funny enough, only after we theorized the ontology of community we realise DMaS was in a "dangerous" situation when they transformed from a successful artist-led initiative to a collectively governed community.

Based on the ontology framework, the initiative already attracted a lot of public attention which reflects on a much thicker upper half of the circle chart. But as a newly formed community, all the necessary aspects in the lower half were radically

IMAGE 1. Between past and future - a road in Kalentzi, Greece (September 8, Kalentzi, Greece. Leo Stillinger.)

sparser, given the members hardly knew each other and hadn't begun the communal work. This creates the first round of urges not only because the maintenance labour aspect of the community is nearing 0, but also because many public aspects were at high scores and the big differences between the aspects trigger the "polarisation collapse" rule. This means that the internal situation of the community may not be able to handle the high expectations from the outside, and this polarization can cause the collapse of the community. Players need to immediately act on the lowest aspects of the community but also need to think ahead on the future wellbeing of the community. Collaboration almost happens immediately in the game.

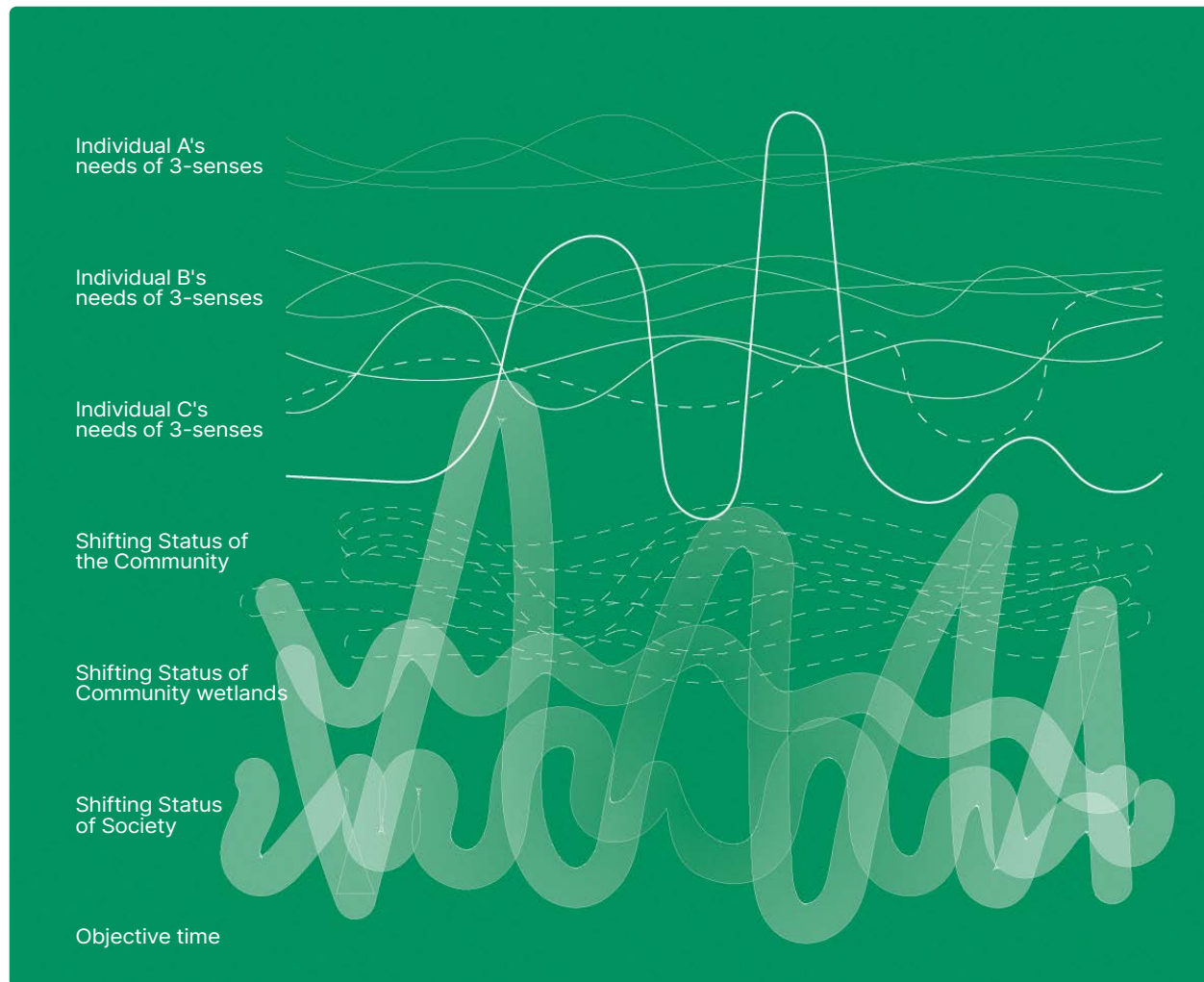
But it wasn't always the case. In the earlier versions, when there was no urgency for the players to act, they usually got confused and bored. Even though mechanisms like interpreting experience points into personal three senses were interesting, players were not able to have an emotional connection with it,

IMAGE 1. Between past and future - a road in Kalentzi, Greece (September 8, Kalentzi, Greece. Leo Stillinger.)

possibly because of the lack of urgency. The urgency we accidentally create when we map the DMaS situation onto the chart actually allows immediate immersion of the game. So there is a practicality in it.

ZZ. It fascinates me how the "game time," which is condensed into several hours, differs from the actual "commoning time," which can impact how players understand, feel and interpret community crises. My previous experience with collectives, including DMaS, is that growth and crisis can both unfold very slowly and covertly, to the extent that not everyone is on the same page about whether and how severe the crisis is. Sometimes the perceptions of collective issues are also gendered and racialized, with minorities sensing the crises much earlier and more intensely. Thus, I wonder what nuances do we capture or overlook when the temporal scale is drastically shortened in AICo.

AY. Indeed, the condensed in-game time will make these nuanced differences within the multilayered personal and collective timeline very difficult to emerge, especially when the canon is largely focused on the community's balanced development. The most evident design that reflects your concern was the



personal stories of the characters, and the story “leads” (players can be rewarded with fragmented information about members, the community, the social environment, etc., and help the progress of community development), which are only visible by individual characters. Players can choose to expose this information and bring it to the community discussion, or they can keep it to themselves until the game ends. One of the most blatant moments was in a community discussion around protecting the safe space of DMaS, and one character who suffered from an intimate relationship with another member would bust out and say: is our collective safe? I don't feel that way. And then a classic moment that the interpersonal conflicts take over the collective discussions reply in front of us. I think it simulates the discrepancies between individual journeys within a collective and the general impression of collective situations. And it's a collaboration between the pre-written script (the archive) and the player (the enactment).

Besides that, there are also micro-moments emerging through the mechanisms, and we are still contemplating what they mean in the outlook. For example, in the DMaS story, there are a few characters who are much easier to get burned out, which has to do with their life situation (represented by life status), their internal needs (represented by the three senses) and their personal events unfolding throughout time, next to the community's happening. When these characters get burned out, other players tend to help them and keep them “alive”. As a result, when the collective tries to decide which aspect of the community can have a positive impact through their activities, the helped characters would feel the urge to express positivity on the “individual nurturing” aspect, while the rest of the members might feel like the need to increase other aspects either out of different perception or practical survival needs (if

IMAGE 1. *Between past and future - a road in Kalentzi, Greece (September 8, Kalentzi, Greece. Leo Stillingner.)*

certain aspects are on crisis level).

There is another mechanism we are not yet able to test is the so-called “contemplating moment”. The contemplating moment is an alternative mechanism that replaces the collective evaluation moment, where the individuals interpret their three senses and their interpretation of the collective status all at the same time. The contemplating moment allows individual interpretation to take place privately at any actionable moment. We expect this will change the game dynamics a lot and probably will create a lot more community friction. But this mechanism is only applicable for longer game sessions, which we will need to find a good place to do so.

Besides the mechanisms to be tested, we are also opening new discussions around the complex time within a community. We already know that solidarity is plural within a community, and according to our solidarity trinity theory, time and body exist throughout the integrated collective experience of labour, body and space [9]. It is pretty obvious that the body is plural within a community, but we think time is the same. Each personal experience of time lumps together with the so-called objective time - or the global coordinated time, consisting of the time complex of a community. We think this might be the entry point where we can discuss a value set that does not alienate the collective solidarity from time and body if we can find a framework to coordinate the plural experiences within a community.

FINAL REFLECTIONS ON MOBILITY AND IMMOBILITY

ZZ. I wonder whether some mechanisms and events touch upon how issues of mobility and immobility might impact commoning practices and the subsequent gameplay. For example, several DMAS members do not live in Shanghai or have relocated since the group was established. Conversely, due to pandemic restrictions, some members may have experienced prolonged periods of being confined to one location. How do we archive and incorporate these mobilities and immobilities into gameplay?

AY. It's very subtle so far. We have one interaction card called “keep the group chat alive!”, this card is expected to have a significant impact when the pandemic hits the storyline. Because the pandemic card will shut down all the physical space and will greatly endanger the Space axes. Only if the players have used that card, the community can survive. And the members who have been in remote conditions will begin to have special skills to keep the community wetland - i.e. supportive network - alive. But admittedly these are not archived in a structural way, but rather embedded in the storyline.

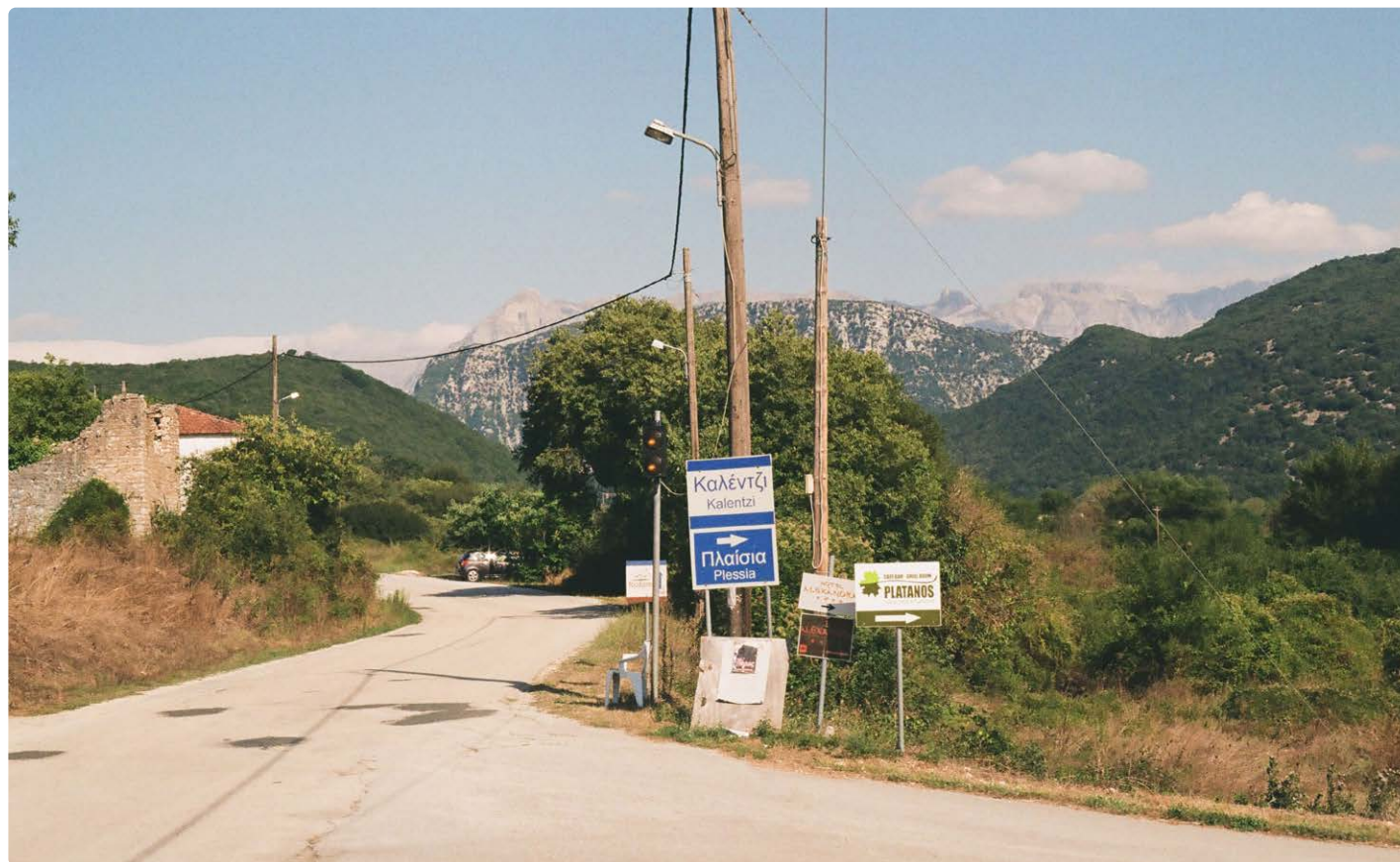
ZZ. Another fascinating dimension touched upon but not fully fleshed out in our previous conversations is the relationship between local grounded practices and the transnational and mobility dimension of many commoning projects. Many DMAS members are not only local activists but also community members and close observers of commoning practices in other cities such as Guangzhou and Tokyo. My understanding of commoning and DMAS has been notably enriched by interactions with those who have woven through various collectives and participated in collaborative events that span cities and borders. Thus to me, even though AIcO may have originated with DMAS, it inherently transcends this singular example, encapsulating a tapestry of commoning practices from a much broader canvas. This being said, I do look forward to the incorporation of more practices in the Majority World into the future versions of AC.

AY. Completely. We already got a lot of comments about why not open this game to a boarder audience instead of an art-related community. But putting a limitation to the type of community we are researching is more about our own AIcOcountability for the materials and framework we provide. And people can always find a game useful in their own context, and also resonate in the community stories that are not necessary from their situated context. Just like when we play DMaS's script in the Netherlands and Germany, the players here don't necessarily have much-embodied experience about China, let alone DMaS. But they can still resonate strongly with the stories, and even gain warm interest in the Dinghaiqiao neighborhood. I think our research did manage to capture some structural issues that exist in intentional communities, so it can transcend this singular example.

Prefiguring Emergent Futures in Learning Practice

Life after Growth summer school in Kalentzi, Greece

Maria Dimitriou-Tsaknaki and Leo Stillinger



PREFIGURING EMERGENT FUTURES IN LEARNING PRACTICE

In the first days of September 2023, the Greek village of Kalentzi, tucked amongst the warm hills of the Epirus region of Greece, bore witness to a singular gathering: the Life after Growth summer school, a meeting of scholars, researchers, artists and practitioners united by the common task of imagining worlds no longer dominated by regimes of forced economic growth.

IMAGE 1. *Between past and future - a road in Kalentzi, Greece (September 8, Kalentzi, Greece. Leo Stillinger.)*

The summer school was put on by prominent researchers of theories of commons and degrowth from the P2P Lab of Tallinn University of Technology, the Post-Growth Innovation Lab of the University of Vigo, and the Department of Social Policy of Democritus University of Thrace and with the participation of the local organisations Wind Empowerment, Habibi.Works, High Mountains, Tzoumakers and Commonen.

For four days, the twenty-odd participants of the summer school took part in participatory lessons on a variety of themes, from the experience of time under capitalism to a reimagining of such basic terms as “needs,” “wants,” and “value.” We also spent the afternoons of the workshop engaged in collaborative activities with the local initiatives from Epirus.

While the summer school may have appeared spontaneous to those who participated, it was the fruit of long planning and deep collaboration amongst a wide network of organisations and researchers. The presence of the Tzoumakers collaborative makerspace in the centre of Kalentzi made the village a natural choice, as the participants became connected to the traces and continuing presence of an alternative community initiative which neatly crystallised the values of the workshop: the creation of grassroots common initiatives as alternatives to existing models of development and economic growth. This utopian project was balanced by the deep presence of the past: Kalentzi is a place which carries and manifests its past tenses, from the Old School where the workshops took place to the Platanos taverna where we ate lunch every day. This unique setting, rooting us in the past while pulling us towards the future, contributed to the feeling of finding ourselves in a foreign and at the same time familiar place as we discussed and learned together.

The two of us, Maria and Leo - an architect from Thessaloniki and an anthropologist from Utah, respectively - were participants and roommates at the summer school. When we decided to set out and write about the experience, we quickly converged on a common idea: the way in which the summer school, while presenting the task of creating shared futures as the content of its lessons, itself enacted this process through the very form of the school itself. From the way lessons were taught to the organisation of time and even the way that decision-making processes themselves were taken in common, the summer school presented a rare and transformative experience: the chance to feel what living in a post-growth world, together, might be like.

In what follows, we discuss three dimensions in which this took place: three ways in which content and form were intertwined in the creation of a unique and prefigurative educational process. By turning

theoretical descriptions into lived experience, the summer school showed what the concrete practice of degrowth can look like playing, thinking, and dreaming about the future through critical reflection on the point of a past-inflected present.

Off the clock: time in common(s)

On the morning of the school's third day, facilitator Maro Pantozidou taught a lesson on time. Building on her doctoral research on the experience of time amongst precarious gig workers and alternative social collectives¹, Maro pushed us to consider the ways in which time is not a neutral physical quality but rather socially co-constructed, lived and felt differently according to our shared beliefs and practices, and shaped intimately by the social and economic formations we inhabit.

The lesson began, not with citations and theory, but rather with twenty minutes in which we could do whatever we wanted. Some of us did yoga stretches on the steps of the school's amphitheatre or sat in silent meditation, while others sketched the landscape, chatted over a coffee, or stretched out for a catnap beneath the morning sun. While Maro kept a timer, most of us lost track of time.

Returning to the classroom after the exercise, we reflected on how qualitatively different those minutes had felt - how liberating to be given time outside the demands of productivity and stresses of a packed schedule. The lecture went on to deconstruct those very demands through an analysis of temporal power: the ways in which our temporal lives are shaped by the clock of capitalism. What would it be like, Maro asked, to live time in a different way - to experience time not as an ever-scarce commodity but as a kind of commons, shaped by the qualities of abundance and conviviality?

Yet we had been learning, first-hand, a kind of answer to that question - not only during those twenty minutes gifted at the beginning of Maro's lesson, but throughout the entire week. The organisation of time in the summer school was marked by a remarkably convivial flexibility. While the school's pre-distributed schedule reported that activities began at 9:00 AM sharp, usually by 9:15 we were still sitting on the stairs of Kalentzi's Old School, enjoying our last sips of coffee and bites of Greek pastry. The morning lesson was followed by a four-hour lunch break, from 1 to 5 PM each day. Of these four hours, we usually spent two eating lunch together in the village taverna, and another two in unstructured exploration: wandering Kalentzi on foot, hiking to explore the nearby gorges and waterfalls, or simply returning to one's room and taking a much-needed nap.

What was remarkable was the way that, despite initial clock-based anxieties, this flexibility never detracted from the “productivity” of the learning experience, but instead enhanced it. If we spent 15 minutes extra sharing a coffee in the morning, this was more than compensated by the sense of full absorption we felt during the lessons, each of us losing track of time as we engaged with each day’s materials. Likewise, the amount of unstructured time given during our lunch break gave us the chance to really get to know each other, while the opportunity to rest meant that, when we returned at 5 (or 5:15) for the afternoon workshops, we felt fully refreshed and excited to engage with the local initiatives. We all had enough time to reflect on what we had been learning, both individually and collectively.



There was a design lesson here. While the clock time of capitalist labour (and learning) might view such a schedule as slack or unpunctual, there was nothing unrigorous about the school’s organisation: it was rather a conscious choice to share a different kind of time together. That choice deepened and enriched our learning far more than a tightly constricted program would have.

At the end of the summer school, it felt impossible that everything we had learned had been squeezed into only four days. It likewise felt impossible that our fellow participants, who now felt more like close friends, had been strangers a mere four days ago. Echoing Maro’s lecture, these magic tricks of time defied our dominant temporal assumptions. While regimes of economic growth favour a conception of time as scarce, linear, ever-accelerating or shattered and lonely –and the texture of our everyday lives under capitalism only reaffirms this– theories of degrowth make room for something different. Time is perceived as relational, flexible and abundant. The schedule of the summer school showed what this alternative could look and feel like; and if the pace of the school felt luxurious at first, it gradually pushed us to imagine a different world: one in which slowness, depth and flexibility of time might not be luxuries at all, but common goods.

Participatory education: learning in common(s)

Degrowth calls us to perceive the interdependence of humans as individuals, collectives, and members of a larger ecology. This interdependence implies a state of vulnerability and partiality in all of us. Degrowth theories are comfortable with participation and shared initiative and leave room for the collective creation of meaning and content.

We participants were not involved in the planning which preceded our arrival in Kalentzi. Yet from the school’s first meeting, it seemed that the responsibility for creating meanings and values was shared among all of us, not only the facilitators.

The participatory nature of the school was reflected in the collaborative creation and flow of discussions. With the participation of all of us, the content was constantly changed, the knowledge that each one of us had in their head give birth to its multiple copies. The moderators structured a plan so that the discussion was out of their complete control. They requested our participation as well as the people of the initiatives in the production of the content.

Characteristically, facilitator Sofia Adam’s lecture on degrowth discourse and theories of needs was re-shaped by our own interventions. In her lesson, she had carefully curated to raise questions which were at once theoretical and experiential. Sophia, initially referring to the history of the concept of degrowth, spoke about how the degrowth movement has often, in its attempt to determine how capitalism as a dominant system constructs our world, separated needs from wants, the necessary from the superfluous, the intrinsic from the prosthetic. But are there basic needs? Are some needs more important than others? Do we all have the same needs? How is “need” determined in a system that constantly cultivates new classifications and divisions? In raising such disorienting questions - how do we really tell a want from a need? - Sofia did not simply impose her own answers. Rather, she divided us in small groups to develop our ideas, our own classifications of wants and needs, in collective conversations that were often animated by lively disagreements. Thus, a rethinking of our basic categories of “wants” and “needs” became a participatory process, and this participation forced us to see those very concepts in a whole new light.

IMAGE 2. *Lingering together - summer school participants practise convivial non-punctuality at the entrance to Kalentzi’s Old School (September 8, Kalentzi, Greece. Joseph Lane.)*



Indeed, throughout the summer school, many needs and wants were met which often go neglected in educational settings. For example, the need for embodied movement: although discourse and dialogue had a dominant role in the summer school experience, there were also important moments where our participation was expressed nonverbally, without that means that embodied participation is an absolute distinct situation from discussion as speech presupposes and constitutes constantly the body.

Every morning the lesson started with the call to assembly in the school yard. There we spent some time standing in a circle, with our bodies facing the centre of it, trying out movement exercises and games under the guidance of facilitators Alicia Trepant Pont, Maro Pantazidou or participants like Abby and Suzanne, who responded to the moderators’ invitation to test our own ideas. The pace and type of exercises that Alicia and Maro coordinated were experimental so that there was room for appropriation and variation. This created the mood to creatively transform the exercise and imagine a new one. Each exercise was determined by our presence and looks. There was no optimal way to move or stop, you didn’t feel like there was a winner and a loser.

IMAGE 3. *Participatory movement - shaping community through an embodied end-of-day activity at Kalentzi’s Old School amphitheatre (September 7, Kalentzi, Greece. Leo Stillinger.)*

In these ways, our participation formed new values. What we learned correlated with what we experienced. And because we participated in the production of meaning, verbally or not, our experiences were captured in the content of the school and became shared knowledge. We found a symbol for this in a large ball of red thread, brought by one of the facilitators, which was constantly put to different uses throughout the week. In one striking activity, we stood in a large circle and took turns saying one question we had about the day’s activities. Each person held onto the thread as it passed to the next, so that as our questions and curiosities accumulated, we found ourselves gradually woven ourselves into a kind of large dreamcatcher.

De-automated process: designing in common(s)

An automated process perceives anything unpredictable as a deviation or an accident, a risk to production. Constantly trying to study all the available parameters, automation seeks, even if it does not always achieve, full control or anticipation of contingencies. Such automation - from factory lines and UberEats algorithms to construction protocols and knowledge alienation - is the invisible basis for regimes of enforced economic growth. It also increasingly shapes the paradox between our controlled, risk-free lives and the precariousness to which we are constantly exposed.

In their opening lecture “On Growth and the Meaning of Life,” Alex Pazaitis and Ben Robra talked about the discomfort that stems from the paradox of rapid, increasingly automated economic growth and



simultaneous environmental degradation and social inequality. In order to survive this contradiction, philosophies of degrowth approach the creation of different value systems².

Yet during the 4 days of participating in the summer school and staying in Kalentzi, we created our own values, in distance from the automated and familiar rhythm that determines most of our daily activities. Our bodies and minds de-automated and interrupted their usual behaviour. The form of the summer school itself was determined by the coexistence between us as well as with the place, a particularly unpredictable and contingent condition.

Lack of full control can mean risk or even opportunity. At the summer school, this unpredictability seemed to be by design. Inviting a diverse assemblage of individuals to coexist in a remote Greek village for four days is far from a recipe for assured, automatic success. But in inviting us to participate in a process radically open to contingencies, the summer school taught us a different framework: to view contingency, with its risks and opportunities, as an integral element of design in a world which necessarily evades our full control.

As a field of coexistence between individuals from different scientific subjects and professional paths, from different geographic and social backgrounds and even different ages, the school was designed to provide the space and time to get to know each other and live together for a while. This process of relating across differences itself contains risks. Yet what emerged was a beautiful relativity of individual experience, a different rhythm. The dependence of one person on the other, both in practical matters and in the

creation of values and meanings and our coexistence with the landscape and climate: this all reminded us that we are always imperfect, supplemented by situations outside of ourselves, constantly exposed to the human, physical or technical field that surrounds us. The summer school invited us into this coexistence and made us comfortable with this exposure to one another. The organisers felt comfortable leaving fluid times and gaps in the process so that we could appropriate parts of it. It was this openness to possibility that perhaps signalled the de-automation we felt and exercised.

Meanwhile, within the classroom, degrowth itself was discussed as a non-definitive concept with multiple meanings and uses. Space was left for the appropriation of the concept and the questioning of what growth or degrowth is for each of us. The summer school promoted the idea that theoretical currents are here to be studied and assimilated while caring about lived experience. This approach, permeating the entire educational process, defined something new and different. How is it possible to think beyond development without transforming the tools and educational processes through which knowledge is shared? Even if the school did not want to offer a clear answer on what life after growth could be, the ways and options that were revealed were multiple and emergent, never dictated from above.

IMAGE 5. Contingency as opportunity - sunny weather and a sheltering plane tree provide the chance to continue a morning lesson outdoors (September 8. Kalentzi, Greece. Joseph Lane.)



Through our vulnerable exposure to rain and mud, to complex and unfinished theoretical discussions, and to each other, the summer school taught what a de-automated learning process can feel like: risky and uncertain but also rich and exciting, filled with singular opportunities. In a world where full control appears less and less likely (if it were ever possible),

the art of designing in organic, responsible, flexibly structured ways appears more important than ever. While, by definition, this art can never be reduced to a single blueprint, the designers of the summer school, in skillfully befriending contingency and openness, gave us one vivid example.

Conclusion: for the knowing of this world, and the making of new worlds

In theories of commons and degrowth, the future is not perceived as a situation absolutely distinct from the present and the past. Rather it lies hidden, waiting to be discovered, in the sedimentations of the past and the possibilities of the present. At the Life after Growth summer school, gathered in an ancient village, huddled beside strangers, we did not only rejoice and relax: we also shared our anxieties, our intense worries about the future. Yet by critically and collectively analysing our own historical era, we felt less confused and alone. And in the fleeting creation of a utopian present - one rich in time, collaborative in design, and joyously improvisatory - we were able to touch, briefly, the concrete image of an alternative future. A better-designed future.

The present condition can accommodate moments that overcome the contradictions and impasses of the contemporary situation. As a moment of suspension, located at the margins of our repetitive obligations and habits of learning, thinking, and doing, the Life after Growth summer school was such a moment. However spatially and temporally delimited the school experience was, it spread like a red thread across the different geographies we inhabit and into our lives afterwards. Writing this review was a testament to our willingness to stick together, experiment and create together. The possibility of another world might just be connected to the future of the relationships we build.

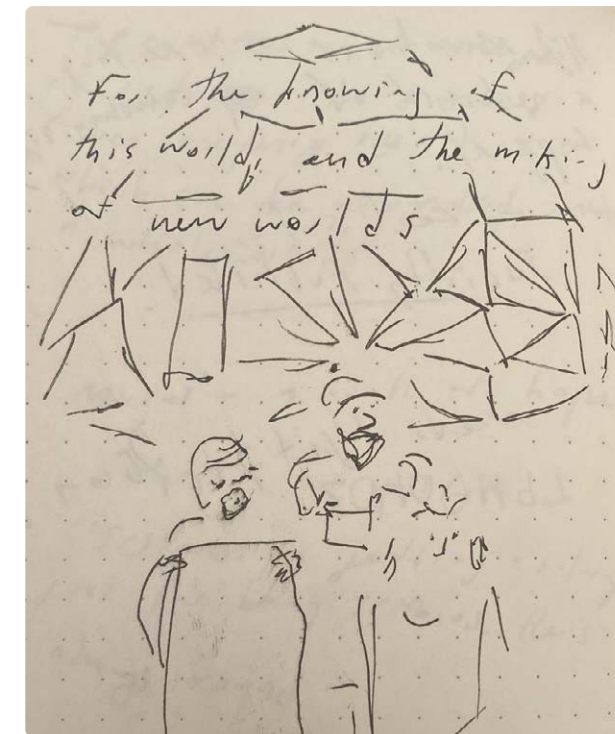


IMAGE 6. "For the knowing of this world, and the making of new worlds" - sketch of facilitators and Tzoumakers' geodesic dome, by a summer school participant (September 9. Leo Stillinger.)

From prototypes to possibilities:

Democratising design through learning

Design exerts a profound influence on the world around us, influencing our daily interactions and shaping systemic structures. However, the design process has often been confined to a privileged few, limiting the diversity of ideas and perspectives that could drive positive change. The democratization of design is not just a vision; it's a necessity. One viable avenue for democratizing the design discipline is through education, sharing ways of knowing, doing, and making. Design education should be accessible, inviting learners from diverse backgrounds to engage in the creative process. Whether on a neighbourhood bench or within university halls, design education can take place in many forms. By democratizing design through learning, we aim to dismantle barriers and empower individuals, regardless of their socio-economic status, cultural background, or prior design experience, to actively contribute to shaping a better future.

This chapter establishes the groundwork for an exploration of the dynamic intersection between education, design, and accessibility. We delve into the idea that design is not merely a privilege for a select few but a tool that, when placed in the hands of many, can inspire innovation, foster inclusivity, and ignite creativity across diverse communities. Our contributors explore emerging educational models that revolutionise traditional learning paradigms, embrace technology, foster flexibility, and equip learners for the dynamic challenges of the future. Through the stories of individuals (and collectives) who have harnessed design tools to address real-world challenges, we uncover the potential that lies in the hands of those willing to learn, adapt, and create.

Fostering Learning Environments for the Future

Composing infrastructures for peer learning and commoning practices within School of Commons

By Amy Gowen from School of Commons

School of Commons (SoC) is a ten-month programme and community-based initiative situated within the Zürich University of the Arts with a strong commitment to the exploration and advancement of self-organised knowledge production¹. Despite taking its form as a School, SoC stands apart from traditional educational structures in that its content and direction are not predetermined by a fixed program or curricula. Instead, they are shaped by the collective know-how, ways and workings, aspirations, and curiosity of its dedicated communities. This approach garners a collaborative, communal spirit that runs throughout SoC's programme and learning environments, creating a dynamic that allows for fresh perspectives, innovative ideas, and a continuous evolution of knowledge exploration and distribution.

Projects that have taken part in SoC are hugely varied in their form, approach, and vision. Over the eight years of its existence, SoC has welcomed projects focussing on alternative housing models, (ultra) translation, language production, LARPing, alternate worlding, expanded publishing, teleportation, and learning from fungi and forests, just to name select examples². Though the projects that shape SoC straddle the scope of research and practice, all are united in their endeavour to learn from, share with, and exchange as part of commons-informed learning environments, amongst diverse peers and publics.

Despite the malleable structure of the School of Commons, certain core infrastructures inform, maintain, and uphold the learning environments, which, in turn, allow for unexpected encounters, new connections, and evolving directions to unfold and flourish within each cohort. Moreover, these infrastructures lay the basis for the two central components that compose the SoC learning environments, the first being the notion of "peer learning" and the second being "commoning practices".

This article is an exploration of the core infrastructures and methods from which the learning environments, based upon the principles of peer learning and commoning practices, have been maintained and reproduced. The examples will be examined both through the lens of the theoretical frameworks from which these environments are grounded, as well as the core methodologies that have been developed through active ways and workings brought to life through the day-to-day activities, and programmatic structures within the SoC learning community.

SOC LEARNING ENVIRONMENTS

School of Commons produces, and is, in turn, produced by multiple forms of learning. The learning environments themselves can be understood simply as digital, physical and satellite in their form. The main programme offering and exchange of SoC is facilitated digitally, using video technology and digital meeting infrastructures for connecting and exchange. This is used in combination with collaboration-focussed tools such as Etherpads, Miroboards, Zoom and Discord, which are considered core methodologies for alternative ways and workings in and of themselves. The emphasis on digital learning environments as the basis for SoC is paramount, as it ensures access for participants anywhere in the world. Each year, in correspondence with the selected cohort, differing time zones, meeting schedules and digital meeting offerings are assembled to ensure maximum participation accessibility. The digital toolset builds upon the accessibility further by ensuring the programme can incorporate and honour different languages, registers, modes of participation, communication and expression.

The physical learning environment of SoC is mainly based around the Zürich University of the Arts, Switzerland where each cohort gathers twice a year for an "intensive weekend" of sharing and exchanging,

and an "end of year assembly" for making public the processes, progress, and findings of the research projects. These public and semi-public exchanges usually take the form of exhibitions, workshops, town halls, walks and lectures. Alongside the University Campus, public spaces, bars, cafes and off-spaces are activated for walks, talks, drinks, parties, talks, and other encounters that sit outside of the "official" programme of School of Commons, but are just as influential to the ways and working of participants' individual and collective processes.

The satellite learning environments of SoC take place across different countries, cities and contexts, around the world. This includes satellite programmes as companions to the bi-yearly Zürich meetups. Examples of which have previously taken place in Chile, South Africa, Costa Rica, the Netherlands, and Germany. The satellite learning environment also encompasses the alumni network of School of Commons which expands far beyond the confines of the ten-month programme. The growing School of Commons alumni network is an active and engaged community who continue to build upon their knowledge and connections garnered during SoC, to visit, meet up, exchange and plan programming outside of the current SoC activities.

SOC CORE INFRASTRUCTURES

Each learning environment within the overall structure of SoC is in turn made up of both tangible and intangible infrastructures that inform their ways of working, and the shape and form they take. The use of infrastructural frameworks for understanding these specific learning environments within SoC takes inspiration from Susan Leigh Star's interpretation of infrastructures as a "fundamentally relational concept, becoming real infrastructure in relation to organised practices"³. This approach very much aligns with SoC's learning environments form of practice-based learning built upon relationality, and relation-based knowledge production and dissemination. This viewpoint is enhanced by Lauren Berlant's description of infrastructures in *The Commons: Infrastructure for Troubling Times*, as "the movement or patterning of social form. The living mediation that organises life: the lifeworld of structure"⁴. "Lifeworld" seems particularly apt as it encapsulates how infrastructures are alive: active, malleable, and adaptive substrates, that are always in response to new information, inputs, and adaptation in accordance with evolving needs and requirements.

The importance of infrastructures as frameworks for more tangible learning formats is emphasised in *Extrastatecraft: The Power of Infrastructure Space*, where Keller Easterling explains that infrastructures act as binding mediums in organisations, structures,

and environments. He states "Infrastructures determine the conditions under which we live our lives and give us a deeper understanding of the world. Infrastructures allow the movement of people, goods, of information. They offer the ground on which systems operate and services are offered"⁵. This is combined with a deeper understanding of infrastructures as "embedded", invisible, ephemeral relations that take place within a learning environment, as described by Erik Klingenberg, who conveys infrastructure as "sunk into and inside of other structures, social arrangements, and technologies."⁶

SoC has also developed learning environments based on a series of select infrastructures that inform how the learning environments are made, creates spaces and relations, and behave. It is through the workings of these infrastructures that certain inherent outcomes of the SoC learning environments take form and shape. For instance, safe spaces, strong relational connections, confidence for participants to choose process over progress methodologies, renewed approaches towards experimentation, the unknown, and systems of unlearning with their practices.

The first infrastructure in which SoC bases its learning environments upon is affective infrastructure; infrastructures based upon an understanding and appreciation of the importance of affect in establishing relations with one another, and choosing how we wish to live and be in the world. Sara Ahmed demonstrates in *Affective Economies* that affect can be understood as a condition, a reaction, an embodiment of feeling and/or desire that is cognitive, proprioceptive, behaviour and psychological⁷. Affect can be felt, transmitted, responded to through language, gesture, facial recognition, voice, posture, and recognition of emotion⁸. Affect as an infrastructural form is further strengthened by Lauren Berlant, who states, "affective assemblages are what bind us to each other and to the world itself. They are an invitation to study and practise different forms of persistent togetherness or ongoingness. Ways to keep in, and with, these messed up, troubled times"⁹.

Affective infrastructures showcase acts or "structures of feeling or desire", desire for different ways of being together, of working together and ways of understanding the world. Affective infrastructures place feeling and memory at the forefront of their operationality, as well as their methods of doing, ways of producing and organising. They question how imaginative, living infrastructures can accommodate multiplicity and difference, mobilise bodies, and build new worlds.

One of the main ways in which affective infrastructures appear throughout SoC is in the "process over outcome" ethos and methodology. From the point of application to the final assembly, no expectation is placed on participants to produce or provide a set

outcome or result. Instead, the emphasis is placed on process, understood by new connections, insight, and perspectives, in turn new ways of imagining and enacting how to be together, how to exchange, how to work together, and what knowledge feels, looks, sounds, and smells like.

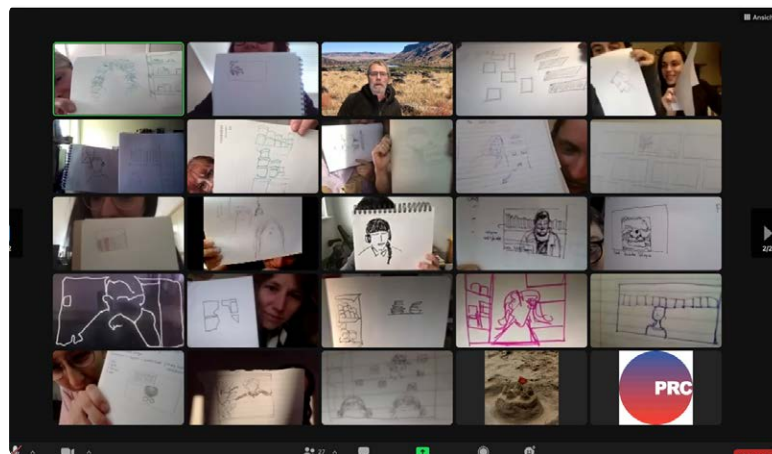
One of the ways in which these often ephemeral processes are documented is through the Ways & Workings (W&W) directory¹⁰. Ways and Workings is a methodology developed by School of Commons which assembles and amasses the various themes, methods, and environments that are essential to forming spaces of learning and knowledge. W&W function as navigational tools that seek to connect various sites of work, practice, and research. In turn creating a broad, alternative, multidimensional directory of how to work together, how to work within and around dominant, often oppressive, systems, and how to imagine knowledge, distribution, research, and practice, otherwise. The Ways & Workings acknowledged and activated in the directory are typically informal, against-the-grain, and alternative in their approach.

Another example of capturing these processes and affective infrastructures is through the multiple publishing channels that flow through SoC. Each project is provided with a dedicated digital publishing space to share, through text, video, audio or otherwise, moments, findings, and challenges in their process trajectory. Each year the collective digital publication ISSUES is compiled that seeks to document some of the changes, challenges, questions and ways and workings participants have developed through their projects, but also as a cohort¹¹. These are combined with key milestones throughout the programme such as "Kitchen Sessions". A dedicated time and space where each project are invited to share not only their project and interests, but the context from which they are researching and practising. The Kitchen Session is a safely facilitated space where room for unlearning, not-knowing is facilitated, academic or artistic vulnerability and fragility can be engendered in a way that is encouraged and supported.

The second infrastructure which forms the core of the SoC learning environments are care infrastructure. Care infrastructures seek to resituate the personal, the public and the political in relation to one another, in turn building new relationship models. These infrastructures work through the "collective"; through exchange, sharing and togetherness, as opposed to the individual, or through set power hierarchies. Researcher and curator Sascia Bailer states, "to care is to be co-dependent, to extend and share resources, knowledge, and to feel commitment and solidarity. A central ethical principle in our social infrastructures"¹². Care infrastructures call for structural vulnerability and fragility, and dedicated spaces to build values and experiences of trust, support, self-worth, and

recognition. They ensure that wellbeing and support are at the core of all operations, in combination with, as theorist and curator Daphne Drago states, "the need to care critically, to care with and for each other"¹³.

A smaller scale, less tangible, yet no less integral method for harnessing care infrastructures through the duration of the SoC programme is through the check-in and check-out methodology that begins and ends each collective meeting and/or public session. These check-ins range from drawing other participants in the room, to singing together, to joining somatic and breathwork exercises. Through the repetition of always entering in and leaving the digital space in this way a sense of safety, cohesion and calmness is garnered, as well as fostering connectivity and relationality.



A more tangible example, and one of the earliest for each programmatic cycle is using a Care Rider. A dedicated form that each participant is required to fill out to share, with their permission, access needs, preferred communication styles, preferred programmatic structures, and the level of (self) organisation and accountability that will allow them to thrive within the programme. Alongside the Care Rider, SoC offers small one to one session which introduces the Care Rider as an apparatus, and examples of what could be included, as, for a Care Rider fulfil its care function, it must be accessible to those who wish to complete it.

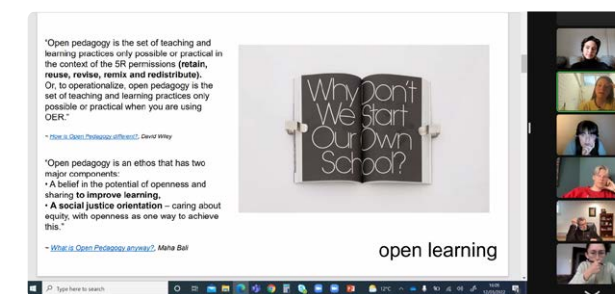
IMAGE 1. An example of a SoC check-in moment. Participants are asked to select another participant in the room, without telling them, and spend 10 minutes drawing them. All participants reveal their drawings at the same time.

The Care Rider is combined with further protocols that uphold care-based values of SoC. These can be found in a dedicated code of conduct, codes of participation, which emphasise that the act of participation can take many shapes and forms, depending on the needs and capacity of the individual, including the right to leave at any point. Moreover, alternative forms of documentation and access to information and knowledge production are provided as aftercare for most meetings and events: through alternative transcriptions, recordings, email summaries, and extra meetings, to ensure that it can be accessed later or from afar.

Perhaps one of the more overt infrastructure layers with SoC is commons infrastructure, understood as the dynamic of assembling, especially with a basis built on social practices, modes of sociality, and ways of defining social, ecological, and planetary relations. Commons infrastructures are not only based on sharing and exchanging, for instance with resources and knowledge, but also on the acknowledgement of difference and conflict. In this sense, they can be dialogical, experiential, as well as a lens for critique and affirmation as much as a method for resistance and creation. In The Posthuman Glossary Lindsay Grace Weber states they "should be understood as constant emergence, of commons social, economic, and environmental relations and practices. They are spaces of experimentation for both theorizing and practicing, providing a lens for critique and affirmation and a method of resistance and creation"¹⁴.

Within SoC, commons infrastructures are present across many levels. Firstly, through the active dismantling of the teacher/student dichotomy. This is encouraged through the open exchange sessions during the planned Kitchen Sessions, as well as the multiple open spaces for self-organisation which are placed throughout the programme. During on-site weekends together each project is invited to participate with a workshop, walk, talk, performance, or otherwise, of their choosing, in which others in the programme attend. Beyond this planned programme of workshops and events, open spaces are left for experiments in collaboration and participation to merge. When such moments occur, the barriers between the knowledge "giver" and the workshop "attendee" start to become remixed. For all programming, SoC offers the 3/3 model: one third offering/giving, one third being offered/taking, and one third free space to encourage unexpected and spontaneous connections and collaborators. This model demonstrates that not only can every student be a teacher, and vice versa, but given the appropriate facilitation and space often dynamics are assembled where these roles can be both embodied simultaneously and entirely dismantled. This dismantling of the teacher/student dichotomy is further strengthened with the active dissolution of disciplinary silos throughout the programme. This

is actively championed by connecting projects and people through curiosities and interests, rather than specific skill-sets or disciplinary backgrounds.



A further core commons infrastructure within SoC is the commitment to "making public". Making public is a programme trajectory that encompasses apparatus such as the annual digital publication ISSUES, dedicated publishing blogs, the Ways and Working trajectory, public events, and public podcasts. Making Public is thus the action of reproducing the knowledge, know-how and methodologies, brought to, formed within, and circulated amongst the SoC environments, outwards. Be that to the cohort, to alumni, to publics, and much further beyond. With consent, all that is produced within SoC, be that an etherpad workshop exercise, a publication, or a radio broadcast, is made public through the different digital and physical tools that are circulated as part of the programme and infrastructure. Knowledge is treated as a material and immaterial resource that, once identified, and activated, becomes porous throughout and outside of the structures of SoC. In doing so, becoming connected to and expanded upon by relevant groups and communities with similar curiosities.

To specifically discuss conflict and difference management, a core component of commons infrastructure. The SoC Code of Conduct acts as the primary basis for how modes of communication and behaviour are expected to be enacted. Beyond this, sessions dedicated to individual and group feedback, meditation and conflict resolution are accessible to participants throughout the entire programme, alongside dedicated moments after key-milestones for larger-scale feedback to be shared. Moreover, all participants have access to dedicated one to one feedback and check-in sessions throughout the year where topics such as accessibility, conflicts, and barriers are regularly addressed and, if required, discussed.

IMAGE 2. An example of an open Kitchen Session, a presentation of what Open Learning can look like in different contexts.

The final infrastructure of note is social infrastructure, which runs along the intersections of differing socialites, and can be found within the complex combinations of objects, spaces, persons, practices, and principles within a given environment and in particular social relations to one another. Essentially, social infrastructures form the foundations of how we interact and how we gather. Dedicated spaces and structures are therefore vital for channelling social infrastructures and for strong social infrastructural bonds, relationships, and behaviours to be nurtured. In *Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization and the Decline of Civic Life*, Erik Klingenberg states that social infrastructures is one of the main factors for engendering social cohesion as, “social cohesion develops through repeated human interaction and join participation in shared projects, not merely from a principles commitment to abstract values and beliefs”¹⁵.

The social infrastructure within SoC naturally appears more overtly during the longer physical get-togethers positioned throughout the programme. These include the Intensive Weekend at the midpoint of the programme in June where participants can share and show their “process”, and any results they wish to disseminate, or challenges they would prefer to ruminate on, and the end of year assembly where these are made public. These moments have made pre-planned social infrastructures as part of their setup and structure: exchange-based workshops, knowledge circulation, and participatory events, and planned collective free time. What is perhaps more pertinent is that it is the more unplanned “between” moments that more affective social infrastructures come to life. Acts of cooking together, staying in the same accommodation, walking together between locations, and cleaning together creates a social fabric of connections and collaborations.

Alongside natural occurrences of social cohesion, there are also more meditated moments throughout the programme, too, where the SoC team take on a more facilitation-focussed role. The most obvious of these moments is the kick-off weekend, facilitated digitally. During the kick-off weekend each project is invited to share a little about their work and context, as well as some of the questions they wish to explore, or challenges they are either already, or foresee facing. Through these presentations, always followed by a dedicated open question and response session, a networked correlation of curiosities and interests, problems and pathways begin to emerge. From this social information, the SoC team begins to suggest, sometimes expected, often unexpected connections. Further dedicated spaces for crossover and connection are then facilitated through focus groups, group check ins, and “extracurricular” activities such as reading groups, writing groups and yoga sessions, where cohesion is notably strengthened.

Within the SoC learning environments there are clear links between each of the above infrastructures, as rather than being standalone substrates, they work best when informing one another, as part of a networked infrastructure of togetherness, or, as infrastructural design engineer Louis Bucciarelli understands it, a “dense interwoven fabric”¹⁶.

A further important element to consider when examining infrastructures in relation to the SoC learning environments is that although infrastructures and subtracts enact, inform, and perpetrate all forms of organising and organisational methods, infrastructures are used and upheld by people, and, therefore, by access. Infrastructures are not separate to or from us. They are implemented, maintained, and reproduced by those who sit within their structures and systems. Therefore, alongside the implementation of such infrastructures there also needs to be the assurance that first, they are accessible, and, once so, are maintained, cared for and, if appropriate, reproduced by those affected by and affecting them. This is why SoC always understands its community and publics not only as being integral to the maintenance of the core learning infrastructures, but as part of the very infrastructures themselves.



IMAGE 3. A performance and working during the SoC Intensive 2022 on Street games of Our Childhoods

PEER LEARNING

This series of infrastructures come together as the basis for the two key components that together form the SoC learning environments. These come under two main categories: peer learning and commoning practices. Peer learning has emerged as a powerful educational method that harnesses the collective knowledge and experiences of learners, placing them at the centre of the learning process. It recognizes that individuals have a lot to gain from engaging with their peers, fostering collaborative and interactive environments that promote deeper understanding, critical thinking, and personal growth. At its core, peer learning involves the active engagement and participation of learners in a reciprocal exchange of knowledge, skills, and perspectives. Rather than relying solely on traditional teacher-student dynamics, peer learning encourages learners to become both teachers and learners themselves, creating a symbiotic relationship where everyone benefits from the shared expertise within the group.

One of the fundamental principles of peer learning is that learners are uniquely positioned to support and challenge one another. By working together, sharing ideas, and providing feedback, peers can offer multiple perspectives and diverse approaches to problem-solving, encouraging a deeper exploration of concepts and fostering creativity. This collaborative process helps learners develop critical thinking skills, enhances their communication abilities, and promotes a sense of ownership over their learning journey.

In peer learning environments, learners can engage actively in the construction of knowledges. Through discussions, group projects, and cooperative activities, they can deepen their understanding by articulating their thoughts and engaging in meaningful dialogue with their peers. This interactive process encourages reflection, as well as the exploration of different viewpoints. In turn nurturing a sense of empathy and respect for others' perspectives. Moreover, peer learning provides a supportive and inclusive learning community. It creates a space where learners feel comfortable expressing their ideas, seeking assistance, and learning from their peers' experiences. This collaborative approach fosters a sense of belonging, increases motivation, and encourages learners to take ownership of their education.

Peer learning also has numerous benefits beyond the academic realm. It cultivates important social and interpersonal skills, such as active listening, empathy, and effective communication. By collaborating with peers from diverse backgrounds, learners develop cross-cultural understanding, tolerance, and appreciation for different perspectives. These interpersonal skills are invaluable in preparing individuals for the complexities of the professional world and in broader society.

The peer learning structure of SoC, which centres curiosity-driven research and practice, life-long learning, and interdisciplinary approaches, establishes a community of practitioners in which reciprocal exchange, openness, and a friendly atmosphere are the main ingredients to social cohesion and successful peer-centred collaborations. Participants are the central part of the larger whole within the SoC structure, in which their presence is both valued and necessary. The aim of this peer learning structure is to develop a programme that is open to all, making the knowledge and practices that arise from our labs publicly available. Collaborations are encouraged between different age groups, disciplines, and (educational) backgrounds. Participants are encouraged to take ownership and authorship of their programme experience and knowledge pursuits, either by organising and hosting events themselves, or by inviting guest speakers and tutors that are relevant to their research. The role of SoC is to support and help organise the educational programme their participants would like to experience. In this sense, a needs and requirements offering is provided, where the peer learning structure directly responds to the peers which form its core.

The outcome of this specific kind of learning structure can be witnessed through the entangled mutual support systems, cross disciplinary collaborations, process-oriented focuses, and non-linear research and practice trajectories that emerge year after year. The approaches, process, outcomes and needs and requirements that materialise from the participants themselves then continuously feed into the peer learning structure that defines the directions and focuses SoC takes each year.

COMMONING PRACTICES

To speak of the “commons” within School of Commons, it is first useful to provide the basis for the terminology and model that commons, and commoning practices provide to institutions and structures like SoC. The commons has been understood as the shared use and management of resources by and for a community. Intrinsic to the existence of a commons is a sharing of governance, a sense of communal belonging, co-operation among community members or commoners, and a deepened sense of societal responsibility¹⁷. Community activist Karl Linn believes that when sufficiently sustained, “commons offer spaces of experimentation and encounter that can be personalised to meet the needs of their individual community.”¹⁸In this respect, commoning can be recognized as a guiding principle of organisation, a strategy for assemblage, and the embodiment of coordinates for maintaining community relations.

Historically speaking, the commons is by no means a new concept. With an etymology dating back to the British feudal living of the sixteenth and seventeenth centuries, the direct link between commons, land and ownership has continued ever since¹⁹. This being said, the 1960s saw a particular resurgence of use of the commons framework in a bid to oppose the advancing neoliberalization of governments that was being experienced during this period. From 1960 onwards discussions surrounding the commons become mainly associated with economics and governance, especially in scholarly discourse, following the publication of Garrett Hardin's influential essay *The Tragedy of the Commons*. Hardin's publication mourned the overuse of natural resources and the subsequent accelerated enclosure of common pool resources²⁰.

Partly as a response to Hardin's pessimistic approach, economist Elinor Ostrom issued a series of works examining the ways in which commons were seen to be flourishing around different parts of the world²¹. In her publications she attempted to forge feasible frameworks and guides for successfully, and sustainably, reproducing these examples of successful commoning. Ostrom's work gained both scholarly and popular attention after she was awarded the Nobel Prize in Economics in 2009, sparking another wave of interest in the economic and societal relevance of the commons. Such a resurgence was especially apparent during this period due to coinciding with the repercussions of the European financial crash.

More recently, the commons has come to also be understood in relation to methods and spaces which facilitate the mutual exchange between aesthetics and politics and as a method of raising awareness of social ecologies of the individual, the collective and the institution²². Therefore, despite established scholarly attention on material commons, the frequent referencing of knowledge commons, digital commons, network commons and creative commons is becoming visible, suggesting a considerable shift in contemporary understandings of the concept. This is supported by Michael Hardt and Anthony Negri, influential theorists on the relationship between commons, ideologies and governance, who argue that the "common" is now not only limited to natural resources, but also contributes to the production of language, knowledge, codes, information, emotion and affect, proving immaterial commons to be an essential resource in the resistance against neoliberal agendas²³.

By considering commons as a composite term that encompasses the political, economic, social, and cultural, we can understand "the commons" within a framework such as a "school" is one in which the environments both enable and distribute resources around art, culture, knowledge and language.

Through these common spaces of experimentation, learning and encounter ecologies of care, through collaborative and cooperative means, transform knowledge production into something for and of "the common", rather than being protected and privatised.

To establish a commons as part of any given environment or structure, three key components are required: the commons (resources), commoners (people, a community, a group) and commoning practices (the act of sharing said resources with said people)²⁴. Commoning practices thus centre methods approaches which aim to facilitate the equally accessible management and distribution of a set of resources, within a given community. Commoning practices within learning environments therefore work with alternative models of open-access distribution, non-hierarchical practices, and co-creation, collaboration, and relationality focused methods.

Within the SoC learning environments commoning practices work across multiple trajectories yet are always in direct connection to one another. They are at times formal, at others informal, and, moreover, can be both material and immaterial in their representation. The knowledge that can be produced and shared as part of these actions and practices is broad and entangled in its scope: tacit knowledge, inherited knowledge, lived experience, context-specific know-how are just as vital to the commoning within SoC as the establishing and remixing of theoretical, pedagogical, scientific, artistic or philosophical propositions. Commoning can take the form of a newly acquired tool for accessibility, an alternative form of participation or exchange, in the sharing of a reading list, supporting during workshops, teaching a new recipe to cook together during an in-person gathering. However, commoning is also a change in perspective, understanding or imagining of what it means to work together, to be together, to know and to do, demonstrated through the many Ways and Workings that have been assembled over the eight years of SoC's existence.



[Learn more about the School of Commons here](#)

It is through the large scale, identifiable commoning activities, such as public workshops, cross-cultural collaborations, open-source documentation, publication contributions and ways and workings activations that the commons is seen within SoC. Yet commoning is also visceral experience through the smaller scale, humdrum activities. Through the smaller and the larger scale, the visible and invisible, the interwoven commons fabric of SoC upholds larger structures of peer learning, learning infrastructures and learning environments that together, produce a global, ten-month community-based programme based around active, ongoing, continuous notions of commoning.

CONCLUSION: LEARNING ENVIRONMENTS FOR THE FUTURE

Through its learning environments, infrastructures, and apparatus of peer learning and commoning practices, School of Commons has composed a clear framework for producing alternative structures for knowledge production and distribution. To look towards the future of learning environments, and how they can continue to adapt and evolve, the answer lies simply, yet in varying forms, in accessible. First and foremost, in ensuring that programmes like SoC, but the many others that are also endeavouring to offer alternatives to formal education systems and traditional pedagogical structures, are accessible to the many, and not only the select few.

Moreover, one of the ways in which learning environments can continue to strive towards access is ensuring they remain critical, open, and adaptive to the changing needs, desires, and requirements, and to both support and reflect the communities, contexts and society they seek to serve. In tangible terms, this requires room for reflection and growth, as well as space for new ideas, experiments, and try-outs to take place. A key component to peer learning and commoning structures is precisely this space to learn and unlearn, to try and to fail, but to ensure it is being enacted in a safe and supportive structure. With specific learning environments like those of SoC, a certain degree must be handed to the peers themselves to choose and dictate the direction they want to take, not only for their cohort, but for the future iterations that will follow.

Accessibility can also be understood in terms of replicability and reproduction. The programme and self-organised curricula of SoC is open access, with most knowledge structures and outputs produced being publicly available. Yet available doesn't always equate too accessible. Features like the W&W Directory is an activation of such resources to provide access to the methodologies, approaches

and environments that are created and circulated as part of the programme. The hope is that others can take inspiration either from individual W&W, or the larger structures created in combination with the many other uses of the programme to produce other learning environments and infrastructure that respond to differing contexts, demands, urgencies, and desires.

All the core components that form learning environments like SoC: infrastructural frameworks, peer learning structures, commoning practices, and accessibility, are in a constant state of flux. They are actions, conditions, apparatus' to be strived for, and adapted towards, and never a permanent state. Learning environments both present and the future must have an acute awareness towards this, and to understand it is the people and the communities that form within these environments that make up these layers, and it is for them and their present and future wishes to which all of these layers and components must remain committed and responsive to.

Counter-Hegemonic Pedagogy within Dominant Design Education

Methodology, Industrial Design Education

By Chiara Del Gaudio from Carleton University

Anyone exploring the role of Design in tackling societal issues, encompassing both sociocultural and environmental concerns, will encounter a rich body of scholarship on this subject. Amidst the diverse initiatives undertaken thus far, two primary discussions and associated efforts emerge. On the one hand, there is a belief in Design's capacity to facilitate the desired change (see, for instance, Ceschin and Gaziulusoy 2016). On the other hand, the debate also delves into Design's entanglement in the creation of these issues, prompting some scholars to devise approaches aimed at improving the 'contribution' of Design in this context.

The discussion surrounding Design's role in the ongoing environmental crises has received widespread attention, prompting notable changes within the field of Design and Design Education¹. However, the examination of Design's involvement in shaping social issues is a more recent focus of consideration. An emerging, albeit relatively small, group of scholars has begun to address the connection between Design and the creation and perpetuation of exclusionary, marginalizing, and oppressive dynamics, advocating for more profound and transformative changes^{2,3,4,5,6,7}.

These voices highlight concerns associated with what is termed Dominant Design—mainstream design knowledge and practice that contribute to Design being one of the root causes of current societal problems. Moreover, these scholars argue that fixing Dominant Design is not feasible, as it originated from the same power dynamics that underlie existing problems. Substantive changes in design practices and knowledge are needed to enable Design to play a constructive role in societal transformation. Design Education emerges as a crucial arena for transformation, as its day-to-day activities might be perpetuating harmful design practices.

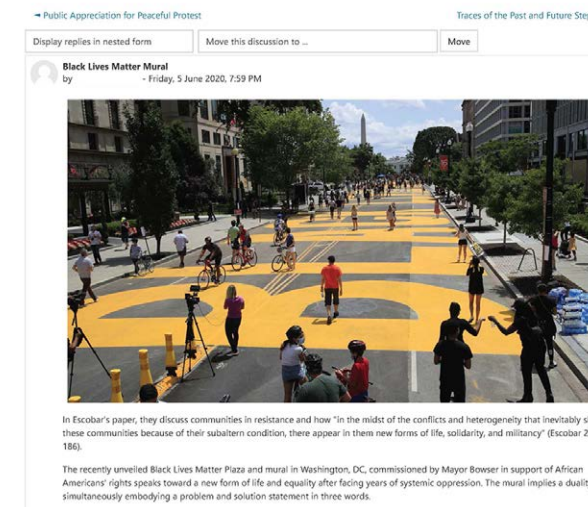
However, Design Education seems to unintentionally hinder the spread of design practices that are not harmful. On the one hand, design schools globally teach Dominant Design. On the other hand, the existence of Design Education is sustained by an economic system rooted in the same power dynamics that we aim to change. Consequently, the system supporting Design Education necessitates Dominant Design and hinders the incorporation of non-hegemonic design approaches in updating and reshaping existing curricula. How can we, therefore, incorporate non-hegemonic design approaches into present-day Design Education?

This review adds to the conversation by detailing the outcomes of applying an unconventional (non-hegemonic) approach to Design within mainstream Design Education. Specifically, I delve into the adversarial work conducted in two courses within a conventional Industrial Design School in North America – one at the undergraduate level and another at the master's level. I share preliminary reflections on students' responses and consider what insights these reactions might offer regarding potential shifts in current Design Education practices.

DOMINANT DESIGN: AN OVERVIEW

Dominant Design is an expression used to refer to Design as it has emerged and developed in Europe and the United States according to Eurocentric and Anglocentric ways of knowing, acting, and seeing^{3,7}. Design, understood and practised from this perspective, has been later disseminated and acknowledged worldwide as 'the way' of practising Design and taught in most Design Schools.

Week 5 - Collective material culture database
Black Lives Matter Mural



Dominant Design stems from the functionalist and rationalist paradigms that shaped its practice and endorses specific values^{3,8,9,10}. These values include functionalism and productivism, solutionism, and universalism—all of which have significantly contributed to existing sociocultural and environmental crises. To illustrate, the perspectives of functionalism and productivism have influenced a knowledge approach that perceives nature as isolated elements that must be understood to serve human needs and purposes¹¹. This approach is problematic as it neglects the intricate relationships among natural elements and between human and non-human entities, establishing a hierarchy that prioritizes human needs and desires.

The emergence and significance of Dominant Design can be attributed to the institutionalization of specific knowledge (that is, Eurocentric and Anglocentric Design). Essentially, the establishment of Design as a discipline and a recognized practice has involved the selective endorsement of specific knowledge in alignment with hegemonic power dynamics¹². Consequently, the institutionalization of Design has historically favoured certain perspectives and practices, reinforcing specific political, power, and economic relations between cultures. This process contributes to Design becoming an instrument of

IMAGE 1. Students weekly connected theory and artefacts in daily life (BLM mural: Washington DC, 2020, AJ+), exploring design practice extensions and implications, going beyond the assigned topic (Ottawa, 2020, Master student).

oppression, as it undermines and devalues existing (or past) cultures¹³. The delineation of Dominant Design knowledge and practice has further legitimized universal viewpoints and dominant techniques, often at the expense of localized and minority perspectives^{3,10}.

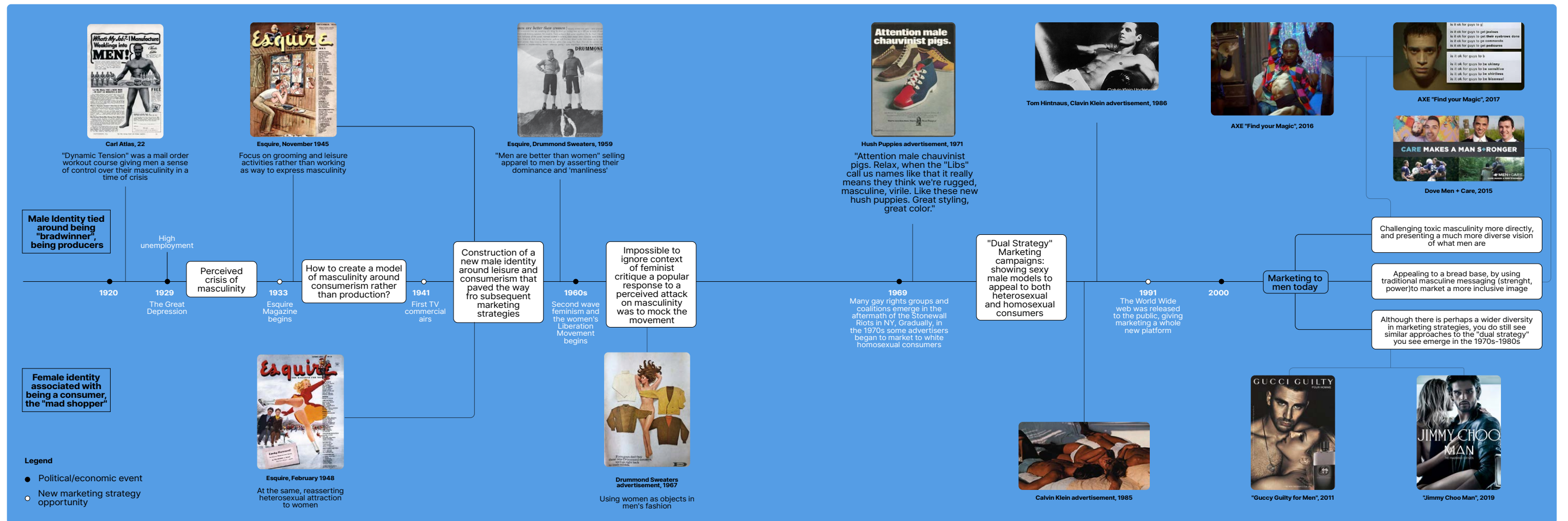
Since Dominant Design is identified as a root cause of current issues, any attempts by Design to provide solutions may inadvertently perpetuate these problems instead of mitigating them. Scholars emphasize that the only viable path forward is a radical transformation and reconsideration of Design, its fundamental principles, and its methods^{10,12}.

DOMINANT DESIGN WITHIN DESIGN EDUCATION

As mentioned above, Dominant Design is prevalent in Design Schools worldwide. A key driver behind its widespread adoption in Design Education is the recognition of its potential for innovation and economic competitiveness¹⁴, along with its ability to address unstable and challenging situations and environments¹⁵. This adoption has occurred even in contexts initially characterized by a different approach to world-making and sense-making.

In a Higher Education system primarily shaped by corporate models, economic interests, and relations¹⁶, Dominant Design becomes a necessary choice for Design Schools to define their curricula. Design students seek an education that aligns with the dominant principles of the job market, including functionalism, productivism, solutionism, and universalism. Consequently, these principles heavily influence the characteristics of current Design Education.

Presently, a substantial number of Design Schools globally emphasize, and in some cases exclusively prioritize, the development of technical skills. According to Meyer and Norman⁷, contemporary Design Education is predominantly performance-based, with curricula concentrating on developing technical competencies such as drawing, colour, form, typography, technologies, materials, manufacturing processes, managerial knowledge, system knowledge and thinking, and leadership. The focus is "upon creating practitioners of great craft"¹⁷. Notably, the authors highlight the minimal inclusion of topics like the societal implications of Design, anthropology, culture, and ethics within Design. These imbalanced and technocratic curricula contribute to the perpetuation of socio-environmental issues that are co-created by the Design field.



However, there have been efforts to explore alternative approaches for non-hegemonic Design Education and practice. One notable example is the work of Lesley Ann Noel, who introduced critical theory concepts and vocabulary (e.g., The Designer's Critical Alphabet) into the design studio. Additionally, in South America, a robust movement of scholars has emerged dedicated to decolonizing local design practices and education. Design pedagogy is viewed as a tool for resistance and political pedagogy, exemplified by cases like ESDI Alberta (translated as 'Open ESDI'), described and discussed by Anastassakis et al¹⁸. The significance of these efforts is underscored by events such as the 2021 PIVOT Conference, which featured a dedicated stream of submissions titled Education for new ways of being. This stream aimed to address fundamental questions, including 'How to educate for other ways of being in the world?'

However, these instances remain exceptions within the broader landscape of Higher Education, facing challenges in transforming into consistent trends that can impact curricula on a larger scale. Given the apparent resistance from the power dynamics within existing education systems against radical and widespread change, instructors aiming to challenge

Dominant Design practices may wonder: What actions can be taken to introduce alternative values and practices to design students?

EXPLORING NON-HEGEMONIC DESIGN EDUCATION CHALLENGES: TWO CASE STUDIES

In my role as an instructor, I attempted to challenge Dominant Design practice by fostering an understanding of its implications and promoting alternative ways of designing. I pursued this objective within mainstream Design Education, and in this review, I focus on two courses that I taught at a School of Industrial Design in North America. The courses took place in a design program rooted in a conventional understanding and approach to Design. The first course was a practice-based course that I taught at the undergraduate level, while the second one was a theory-based course that I taught at the master's level. My counter-hegemonic pedagogy centred on two key aspects:

1. Questioning the conventional perception of Design as a problem-solving activity
2. Cultivating an awareness of the political nature and power dynamics inherent in Design.

Third-year undergraduate design studio

The first case I present involves a third-year, second-term design studio course. Before this course, students had undergone what can be deemed as a conventional Design Education, primarily emphasizing the industrial aspect of Design and the enhancement of technical skills. Specifically, students participated in five design studios, thirteen courses focused on technical skills development and knowledge acquisition (including design fundamentals), and two theoretical courses addressing the relationship between Design and society.

IMAGE 2. An example illustrating how students review the dynamic relationship between gender and design within a particular design field (Ottawa, 2020, Master students)

Given that it was not my first time teaching this course, I retained the same course structure, supporting documents, and teaching approach that had proven successful in the past. The innovation in teaching primarily centred around the specific theme of the brief I assigned to students. I tasked them with contemplating the increasing human desire for social connection, the evolving nature and utilization of public space, and the role of technology in these societal shifts. Students were required to explore these themes through the design process, ultimately creating an artefact or system of artefacts capable of embodying and promoting reflections on current social disconnection and its connection to technology and public space use. The overarching aim was to cultivate an understanding of designers' role in fostering a deeper comprehension of the underlying conditions of existing issues and, consequently, instigating sociocultural change.

My objective was to counteract Dominant Design practice and education by instilling an appreciation for Design's critical thinking qualities, its potential for societal transformation, and its capacity for community-building. In addition to supporting the development of conventional skills relevant to the

course—using methods previously successful—I sought to reinforce this new understanding through various means. These included guest lectures featuring professionals engaged in this type of design practice, discussions on critical, speculative, and political design approaches (including illustrative examples), and a design brief centred on pertinent issues contributing to the local community and discourse. Weekly reviews with students, a customary practice in design studios, were also conducted to assist them in learning.

However, students' responses during the course revealed that the majority invested little effort in their assignments for weekly reviews and final submissions, lacking both quality and content. Over time, students expressed several critiques regarding the organization of the course, course materials, assignments, and teaching approach—elements that had previously been effective. Post-course feedback from students indicated a widespread perception that the course was not deemed useful or valuable, as it did not impart the marketable skills they believed essential for their design careers. Even those who found the course interesting felt it did not significantly contribute to their job-seeking efforts. Notably, to my knowledge, no student included the outcomes of this design studio in their portfolio.

First-year master seminar

The second case involves a first-year master's seminar. Most students in this master's course shared the same undergraduate background, including the institution, as my third-year undergraduate course students. Additionally, before attending this master's seminar, students had completed a seminar course on the interdisciplinary nature of design, a course on academic research methods, and a design studio course focusing on the strategic dimension of design.

It was my first time teaching the course, which I crafted entirely from scratch. Despite being a new endeavour, the course structure mirrored those of some of my prior teachings. The primary innovation was the course's thematic focus. Specifically, it delved into the intricate relationship between Design and the formation of gender identity. Consequently, my aim was to contribute to a non-Dominant Design Education by cultivating an understanding of the transformative potential of Design and its interconnectedness with power dynamics and mechanisms of oppression.

The primary activities in the course comprised theoretical readings, the observation and analysis of local material culture, seminar discussions, and guest lectures. Throughout the course, I fostered a continual interaction between grasping theoretical knowledge, observing and analyzing students' everyday

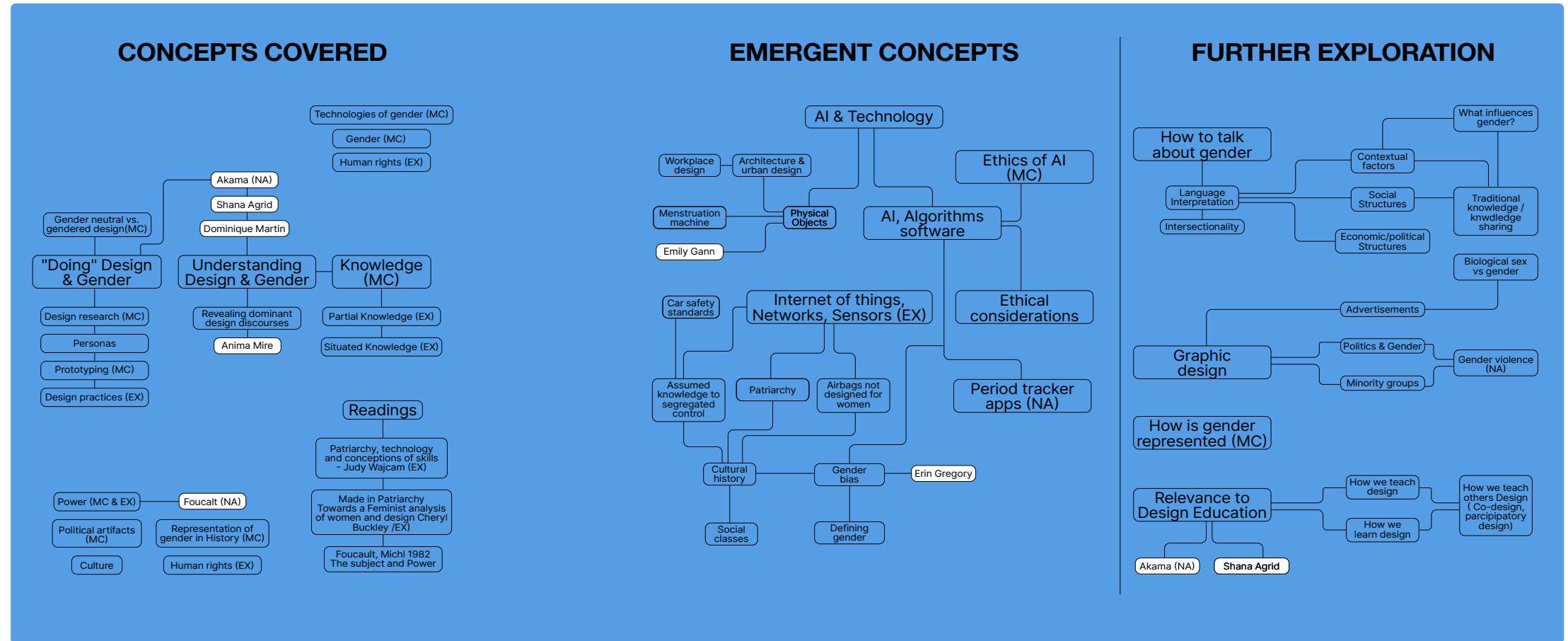


IMAGE 3. Students' diagram captures vital topics in the Gender and Design discourse: instructor-introduced, from in-class activities, and student-identified for future consideration. (Ottawa, 2020, Master students)

environment through this lens [\[image1\]](#), and engaging in class discussions. The key topics selected for class readings included theories on power, reflections on the relationship between Design and power, situated knowledge, ethics in Design, and gender inequality.

Throughout the course, students consistently exhibited a high level of engagement, investing substantial effort in both in-class assignments [\[image 2\]](#) and discussions centred around topics relevant to their lived experiences. On multiple occasions, they expressed the significance of understanding the societal implications of design practice [\[image 3\]](#). Post-course and in subsequent interviews, some students conveyed a sense of responsibility for their future activities and those of their colleagues (current undergraduate design students). Furthermore, they organized a workshop with some of the School's instructors to delve into potential changes in Design Education and strategies to heighten students' awareness of these aspects of Design at an earlier stage.

Reflections and opportunities

The two cases presented demonstrate varying student responses to occasional efforts toward counter-hegemonic design thinking within Dominant Design Education. In the first case, the lack of enthusiasm, minimal engagement, and students' feedback indicated a failure to grasp the potential of Design for critical thinking and societal change. Complaints about administrative aspects may have reflected resistance to change. Conversely, the second case revealed high engagement, a sense of responsibility, and proactive behaviour, showcasing students' understanding and interest in the societal implications of design practice. What factors contributed to such different responses?

To gain insights, I analyzed the difference in how I introduced changes in a conventional Design Education curriculum. It became evident that, in the design studio course, I adhered to a more conventional pedagogic approach, focusing on the practice of design and reviewing students' designs. In contrast, the master seminar emphasized a continuous application of theoretical knowledge about the nature and implications of design practice to students' everyday lives. Despite both courses involving engagement with local issues, the integration and constant interaction between theory (on the nature of Design) and practice was present only in the master one.

In the first case, the absence of theoretical readings and the failure to connect theory and practice hindered the understanding of Design's potential for critical thinking and societal change. It also limited the recognition of Design Education as more than a venue solely for acquiring technical skills. In the second case, it is the time dedicated to discussing the politics of Design that facilitated a deeper understanding of the nature and implications of design practice, encouraging the acceptance of new and diverse approaches.

Additionally, the two different academic levels suggest that undergraduate students may primarily seek to acquire the skills necessary for economic success or market survival, aligning with the principles of a capitalist and neoliberal society. A pedagogical practice not aligned with this may encounter resistance.

These cases suggest that effectively countering Dominant Design Education from within requires promoting an understanding of the nature and potential of Design for societal change, as well as the implications of its practice through (a) incorporating readings from social sciences and humanities and (b) fostering their understanding through continuous interaction between theory, practice, and collective discussion. This highlights the necessity for a robust integration of theory in design studios, particularly in Industrial Design programs.

Fab City Challenge: Driving Global Innovation through Local Impact

Fab City Challenge methodology

By Mitalee Parikh, Daan Sonnemans, Josefina Nano from Fab City Foundation

Following the successful Fab Island Challenge in 2022 (as detailed in the previous Distributed Design Platform publication, Driving Design)¹ and the Fab Bhutan Challenge in July 2023, we, the Fab City Foundation are currently collaborating with the team at Ibero FabLab in Puebla, Mexico, and Fab Foundation on the third annual edition of the Fab City Challenge iterating and evolving the Fab City Challenge methodology.

The Fab City Challenge [QR code 1] is a collaborative innovation initiative designed to address social, environmental, and economic issues, known as 'Challenges,' on a local scale. The program encompasses critical areas of intervention, including Regenerative Materials, Agriculture, Waste Management, Water Conservation, and more. Global teams, comprising participants from diverse backgrounds, collaborate with local initiatives to conceptualize and prototype design solutions, competing for seed funding to realize their proposals. The methodology involves a well-structured organizational and implementation strategy, supported by tools, workshops, guidelines, and frameworks guiding participants through the entire challenge process—from initiation to implementation, evaluation, and knowledge sharing. Coordinated by the Fab City Foundation, the Fab City Challenge stands as a notable program fostering impactful community-driven solutions and facilitating global partnerships.

The 2022 Fab Island Challenge piloted the Fab City Challenge methodology, laying the foundation for the evolved Fab Bhutan Challenge. The latter blended local traditions with cutting-edge innovation, addressing Bhutan's challenges through a fusion of traditional wisdom and digital fabrication. Spanning five Fab Labs across the country, the challenges promoted economic resilience, introduced digital

technologies, and fostered global-local collaboration. With 59 innovators, it targeted areas like interspecies coexistence and climate-adaptive agriculture, aligning with local beliefs. The Fab Bhutan Challenge's success showcases the impact of community unity, earning recognition as a promising investment opportunity by Milan Thomas of the Asian Development Bank².

THE METHODOLOGY

The methodology includes five phases:

1. Initiating the Fab City Challenge
2. Co-creating the challenge ecosystems
3. Implementation
4. Evaluating outputs
5. Dissemination.

Below, we take you through each of the phases, illustrated with examples from the Fab Island Challenge in Bali and the Fab Bhutan Challenge.

1. Initiating a Fab City Challenge: from global platforms to local contexts

The initiation of a Fab City Challenge can occur through various pathways, tailored to different scales and levels of engagement. The annual Fab X Events and Fab City Summit have been primary conduits for large-scale global challenges, hosting iterations in Bali (2022), Bhutan (2023), with developments for Mexico (2024) and the Czech Republic (2025) already underway. Notably, there is increasing interest from other event organizers and institutions to lead local editions, exemplified by the Fab City Challenge during the MakerFaire in Shenzhen in November 2023.

Collaborating with local organizers, the Fab City Foundation conducts a comprehensive ecosystem assessment. This critical step ensures strategic alignment of proposed interventions with the specific needs and dynamics of targeted local ecosystems. The scoping process involves meticulous analysis of urban and regional frameworks, identifying key partners, opportunities, and potential areas for intervention. Engaging with local stakeholders, including government entities, community leaders, and relevant organizations, fosters a collaborative approach that integrates diverse perspectives and local knowledge into the challenge design and planning.

The next step involves selecting and recruiting local challenge hosts, crucial for effective implementation. Typically found in Fab Labs or maker spaces, but also local SMEs and community organisations, these hosts act as key intermediaries to achieve the initiative's goals within the local context.

2. Co-creating Fab City Challenge ecosystems

The second phase of the Fab City Challenge is pivotal, focusing on formulating diverse challenge ecosystems within local contexts. The Fab City Foundation collaborates with local hosts, organizing a series of co-creation workshops to guide the process. These workshops equip hosts with knowledge, tools, and strategic insights for systematic development and management of challenge implementation. The goal is to provide hosts with a deeper understanding of the challenge framework, including objectives, thematic focus areas, and operational guidelines.

During the Fab Bhutan Challenge, a systematic and holistic approach was employed, with workshops spanning twelve weeks leading up to the event. The workshops included:

Ecosystem & stakeholder mapping

- Identify pressing challenges and mapping resources, people, and places to establish potential connections with surrounding communities, industries and institutions.
- Results in the identification of apt areas of intervention, such as Climate Adaptive Agriculture, Water Conservation, Human-Wildlife Conflict, Cultural Preservation, and Assistive Technology.

Partner acquisition approaches

- Provide practical tools and engagement strategies for hosts to collaborate with potential partners.
- Encourage hosts to seek partners from diverse sectors, including citizens, makers, designers, educators, small and medium enterprises, civic societies, non-profit organizations, and policymakers.

- Partners can contribute contextual depth to challenges by sharing perspectives, local cultural nuances, on-ground knowledge, and providing spaces for field visits.
- Global partners are also brought together to provide unique perspectives and their networks contribute towards scaling the solutions and sharing knowledge.

Crafting challenge narratives

- Guide hosts in crafting effective challenge statements, appealing challenge titles, and attractive challenge pitches for open calls of participation.
- Provide support in engaging with multiple stakeholders and adapting narratives to suit specific audiences.

Impact Envisioning

- Collectively envision the impact created by expected outputs for specific challenges across social, environmental and economic scales.
- Support the definition of profiles and skills required from all global and local participants to work on the challenge.

Co-curating challenge teams

- Teams are thoughtfully balanced with global expertise and local traditional knowledge, also considering diversity of backgrounds. Participants are invited to apply individually or as representatives of organizations, contributing skills, technologies, or methodologies.

The co-creation and curation phase builds a significant foundation of the Fab City Challenge, empowering hosts with essential skills, resources and people to tackle complex challenges. The Fab City Foundation curates a unique community of stakeholders, fostering transformative impact and social innovation within a global-local context.

3. Implementing a Fab City Challenge

In the third phase of the Fab City Challenge, after defining challenges and curating teams, the Fab City Foundation supports event organizers and local hosts with logistic arrangements, including travel and accommodations by sharing best practices. Optimum Fab Lab inventory, local material procurement, and low-tech solutions are prioritized. Key challenge milestones are integrated into larger events, such as Bali Fab Fest and Fab23, leveraging expertise from keynote speakers, guests, and experts.

A Fab City Challenge transforms ideas into real-life prototypes, emphasizing the fluid and interconnected nature of the challenge's stages. The five stages of the Fab City Challenge and their critical roles are outlined:

Align & Identify [\[image 1\]](#)

Participants engage with hosts and fellow participants through online onboarding calls and in-person briefings, where comprehensive information about the challenge context is provided.

Explore & Immerse [\[image 2\]](#)

Participants journey to challenge locations for contextual and holistic experiential knowledge. Field trips, immersive experiences, and community engagement are key to gaining valuable insights from multiple stakeholders and different perspectives.

Ideate & Prototype [\[image 3\]](#)

Participants brainstorm solutions and engage in rapid prototyping cycles. The emphasis is on creating prototypes for testing in the next phase.

Test & Iterate [\[image 4\]](#)

Teams gather feedback and iterate prototypes in designated design spaces. Active involvement of community partners in testing and providing feedback is crucial.

Showcase & Share [\[image 5\]](#)

The final stage involves showcasing outcomes to engage the local and broader community. Dedicated showcase events, integrated into the open-to-community Fab Festival, facilitate public participation. Comprehensive documentation and open-sourcing of outcomes contribute to scalability and global sharing.

Throughout these phases, the Fab City Foundation ensures a seamless transition from planning to implementation, fostering collaboration, and addressing challenges for transformative impact.

4. Evaluating Fab City Challenge outputs

The annual Fab City Challenge incorporates a crucial segment where teams work towards seed funding to extend their projects beyond the challenge's scope. During an open day, teams showcase their outcomes, and experts, along with the general public, evaluate them based on predefined criteria aligned with the main event's overarching theme.

In Bali, the evaluation process was guided by the local philosophy of 'Tri Hita Karana,' emphasizing a harmonious balance between humans, spirituality, and the natural environment³. In Bhutan, the four pillars of the FAB23 event—Economic Opportunity, Technology & Innovation, Sustainability & Community, and Youth Education—directed the evaluation criteria.

Both challenges saw the Fab City Foundation and Fab Foundation awarding \$5,000 seed funding each to the expert's choice and public favorite. In the Fab Island Challenge, the Helium Foundation pledged



\$2,000 to the team demonstrating the most effective LoRa technology implementation. This showcases the potential for organizations to support specific challenge aspects by offering prize money for particular themes.

Analyzing, sharing, and disseminating the Fab City Challenge

The successful execution of a Fab City Challenge involves adopting the Data In, Data Out (DIDO) approach. This post-challenge phase emphasizes meticulous impact documentation, feedback, reflection, analysis, and global outreach for disseminating processes and results. The Fab City Challenge's dissemination operates at dual levels, presenting the framework and achievements through multimedia formats like films, photos, and written materials. The Fab City Foundation has produced documentaries chronicling the Bali Fab Island Challenge and the Fab Bhutan Challenge, offering compelling visual narratives.

Beyond audio-visual documentation, the Foundation collaborates with teams and hosts to craft informative blog posts, providing a nuanced participant perspective. Rigorous impact assessments result in comprehensive reports delving into each challenge's intricacies and ramifications. Publications for the Fab Island Challenge and Fab Bhutan Challenge present overviews, individual case studies, and their impact.

IMAGE 1. Kicking-off Fab Bhutan Challenge (July 2023, Bhutan, Daan Sonnemans, Fab City Foundation)



IMAGE 2. Exploring local textile markets (July 2023, Bhutan, Daan Sonnemans, Fab City Foundation)

IMAGE 3. Brainstorming and prototyping initial ideas (July 2023, Bhutan, Daan Sonnemans, Fab City Foundation)



IMAGE 4. Testing low-tech assistive devices with community contributors (July 2023, Bhutan, Daan Sonnemans, Fab City Foundation)



IMAGE 5. Sharing solutions with the community (July 2023, Bhutan, Daan Sonnemans, Fab City Foundation)

In-depth interviews with stakeholders, including the challenge coordination team, enrich the reports with firsthand experiences, creating detailed case studies unravelling multifaceted outcomes and impacts. Constructive feedback from interviews informs the next challenge iteration, fostering continuous improvement.

The Fab City Foundation, following an open-source philosophy, promotes transparency and knowledge exchange. Documenting and disseminating intricate challenge processes and outcomes facilitates knowledge democratization, fostering collaboration, innovation, and collective learning. This approach enables a broader audience to benefit from lessons learned and established best practices during the challenges. Every annual edition of the Fab City Challenge provides an opportunity that is an excerpt within a larger spiral development process to iterate, explore and evolve the methodology.

CONCLUSION AND CONTRIBUTION OF THE FAB CITY CHALLENGE

The Fab City Challenge methodology stands out as a dynamic platform for addressing local issues through collaborative innovation and community-driven impact. Developed and refined over two editions—the Fab Island Challenge in Bali (October 2022) and the subsequent Fab Bhutan Challenge in Bhutan (July 2023)—this methodology brings together diverse local and global stakeholders, fostering partnerships that transcend boundaries of geography, knowledge and practices.

The Fab City Challenge's significance lies in its capacity to unite experts, professionals, community leaders, and innovators, collectively addressing real-world challenges. It encourages sustainable and innovative technology applications to tackle

social, environmental, and economic issues. The methodology offers a structured organizational framework supported by comprehensive tools, workshops, guidelines, and frameworks⁴. It guides participants through the challenge cycle, empowering communities to address local issues while sharing knowledge globally.

The Fab City Challenge's impact is evident in its innovative solutions, enduring collaborations, and promotion of sustainable development. It exemplifies collaborative problem-solving, blending local wisdom and global expertise to drive positive change and foster inclusive, sustainable futures. As a beacon of hope for addressing pressing challenges worldwide, the Fab City Challenge continues to shape the landscape of community-driven impact.

[Explore the Fab City Challenge platform here.](#)



Fostering Open and Distributed Design in Early Design Education

The Case of IPL

By André Rocha, School of Education / Fablab Benfca, IPL - Polytechnic of Lisbon

INTRODUCTION

At the heart of contemporary design education lies a transformative shift, steering away from traditional industry-focused approaches towards embracing the expansive and innovative principles of open and distributed design. This article delves into this pivotal transition, specifically within product design education in the Visual Arts and Technologies BA program at the School of Education, Instituto Politécnico de Lisboa (IPL).

The School of Education at IPL, housing Fablab Benfca and the Visual Arts and Technologies (AVT) BA program, has become a fertile ground for this educational evolution. The period from 2018 to 2023 marks a significant time in which the product design programs within this BA underwent a fundamental change in their approach to teaching product design. The program has embraced a more open and diverse framework, aligning with Distributed Design principles and moving beyond conventional design processes and goals primarily aligned with traditional industry goals.

This strategic shift in pedagogy aims to broaden students' horizons, transcending the traditional confines of a design career. By integrating Distributed Design values¹, the curriculum of these courses retains its technical rigour and expands the realm of possibilities for students. This change facilitates a more holistic understanding of design, encouraging students to explore various applications of their skills and creativity in a rapidly changing global context.

Our investigation focuses on how this shift has impacted student engagement, particularly how they approach design projects. We examine the quality of student work and the evolution of documentation practices, crucial elements in the open design process. This article analyses the integration of open and distributed design principles within product design

education at the School of Education, IPL. It aims to contribute to the ongoing discourse on the future of design education, offering insights and reflections pertinent to educators, practitioners, and institutions aspiring to infuse their curricula with contemporary design principles. Ultimately, this study seeks to illuminate how embracing open and distributed design can enrich the educational experience and empower the next generation of designers to navigate and shape the multifaceted design world.

The early design education transformative shift at IPL aims toward embracing open and Distributed Design values. This evolution aligns with modern pedagogical paradigms while prioritising the Distributed Design values and principles of openness, collaboration, regenerative practices, and ecosystemic thinking.

Kempton, Killi, and Morrison² acknowledge the complexity of modern design tasks, emphasising the need for enhanced collaboration skills and contextual understanding in design education. These insights pave the way for integrating Distributed Design principles, focusing on open, collaborative, and sustainable methodologies, and equipping students with innovative and diverse design practices.

Central to the Distributed Design paradigm is the concept of 'open design,' emphasising transparency, sharing, and accessibility in the design process. Boisseau, Omhover, and Bouchard³ delve into the expansive nature of open design, stressing its relevance in product design and as a pivotal approach to design education. They argue for inclusivity and collaborative engagement, echoing Boehnert, Sinclair, and Dewberry⁴ perspectives on participatory learning environments. Serena Cangiano, Davide Fornari, and Massimo Botta⁵ further highlight the significance of community-driven platforms in fostering resource-rich, inclusive learning spaces.



roles of environmental and non-human elements in shaping design outcomes. This comprehensive view promises to redefine ecosystemic approaches in design education, fostering a more inclusive, ethical, and interconnected understanding of design's role in our world.

The 2nd and 3rd-grade AVT BA product design courses at IPL, embracing these Distributed Design values, represent a strategic shift towards a globally connected yet locally rooted design education. This approach is part of a broader educational movement that values diversity, innovation, and multidisciplinary collaboration, and our subsequent sections will explore how IPL's Visual Arts and Technologies BA program integrates these principles, assessing their impact on student engagement, project outcomes and broader educational implications.

UNFOLDING THE PROCESS

Assignment-Based Contributions to Distributed Design at IPL: 2018 Onwards

At the School of Education of IPL, a gradual and thoughtful shift in early product design education has been underway since 2018, marked by the integration of Distributed Design principles into the Visual Arts and Technologies BA program 2nd and 3rd grade product design courses. This shift aims to align design education with open-source philosophies, global collaboration, and local production, thus broadening the scope of traditional product design education.

The integration of Distributed Design in these product design courses happened in the form of various assignments designed to merge traditional design skills with open and distributed design concepts. These assignments aimed to encourage students to think expansively about their role as designers in a globally connected yet locally rooted context. Each project, spanning different academic years, offered unique contexts and learning outcomes, reflecting the evolving nature of Distributed Design principles in design education.

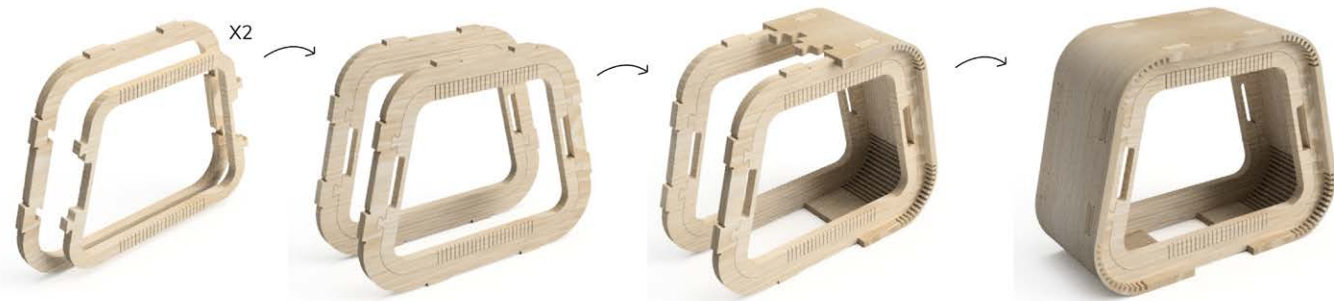
The "Banco de Benfca" assignment, undertaken in 2018-19¹⁰, 2019-20 and 2021-22, tasked students with designing a bench or small stool inspired by the Benfca neighbourhood (surrounding IPL campus). This project emphasised local inspiration combined with the capability for global production. It fostered a sense of global sharing, collaboration, and digital fabrication, underscoring the potential for designs to be produced locally but distributed globally. The outcomes of this project were a range of small benches and stools, each distinctly reflecting the Benfca neighbourhood's character yet adaptable for reinterpretation in different global contexts.

Collaboration is at the core of Distributed Design, facilitating participatory design processes. Boehnert, Sinclair, and Dewberry⁵ underscore the role of collaborative and participatory methods in enriching design education. Frangos et al.⁶ demonstrate how open-source scientific hardware projects thrive in collaborative environments, promoting innovation through user-centric models. Additionally, Cürgen and Gürpınar⁷ emphasise the importance of collaborative and co-creative processes in open design, advocating for these methodologies in the design curriculum.

In the realm of regenerative design, Terzioğlu and Wever⁸ emphasise the integration of repair skills into product design education. They argue for an educational paradigm that minimises environmental impact and actively fosters reparability and longevity in product life cycles, enriching the regenerative design discourse.

Vacanti et al.⁹ introduce a transformative perspective in design research with the 'More-Than-Human' concept. This approach challenges traditional views by emphasising an ecosystemic and holistic integration of humans, technology, and the broader ecological system in design education. The article argues for a paradigm shift towards recognising and respecting the intricate interdependencies between all entities involved in the design process. This nuanced perspective urges educators to go beyond human-centred design, advocating for a more inclusive approach that acknowledges the vital

IMAGE 1. T-AR (David and Sousa 2022) [22] is a great example of another response to the "Banco de Benfca" assignment. In this case the students applied to the Distributed Design Award in 2022. Image by the authors with all rights reserved.



"Banco Eucalipto"¹¹ serves as an exemplary representation of the Distributed Design spirit encapsulated in the "Banco de Benfica" assignment. Drawing inspiration from the eucalyptus leaves in the local Eucalyptus Garden of Benfica, her design ingeniously melds local inspiration with functional ingenuity. The stool, crafted with interlocking pieces, cleverly eliminates the need for tools during assembly, offering a practical and elegant solution for space-constrained urban environments. Its compact design allows for easy storage and adaptability, showcasing a keen understanding of the challenges faced in modern urban living. Mariana's project stands out as a testament to the creative application of open and distributed design principles.

In the 2021-22 academic year, an assignment themed "Aves que nos rodeiam" (Birds Around Us) aligned with the Portuguese national Eco-Schools program. Students were challenged to design a bird feeder suitable for schools, focusing on sustainability and educational engagement. The design could be supplied as documentation for replication, a ready-to-assemble kit, or a complete unit for installation. This project intertwined with an app developed in a Visual Design course, promoting active learning through fieldwork and interaction with nature.

Fernandes and Português¹² "Re-Bird" project exemplifies the innovative spirit of the "Aves que nos rodeiam" (Birds Around Us) initiative. This sustainable bird feeder, designed for Monsanto Park, merges environmental conservation with educational engagement. Crafted using digital carpentry, "Re-Bird" promotes the preservation of bird species and encourages birdwatching tourism. Its design, suitable for easy home assembly, aligns with the educational goals of the Eco-Schools program, fostering natural interaction among schoolchildren. A notable feature is its built-in camera system, enhancing bird study and observation. "Re-Bird" is a creative blend of sustainability, education, and interactive design, showcasing student innovation in the context of the Eco-Schools project.



Another assignment, "Our Garden" introduced in 2022-23, challenged another group of students to design for or around a school garden, creating open educational resources. This project strongly emphasised sustainable design, the development of open resources, and community engagement. The goal was to align the project with Sustainable Development Goals, fostering a sense of global responsibility and heightened awareness of sustainability issues.

Jesus and Pires¹³ Gardy project, still in its conceptual phase, is an innovative proposal from the "Our Garden" assignment, ingeniously integrating technology, education, and sustainability. Designed to connect

IMAGE 2. T-AR (David and Sousa 2022) [22] is a great example of another response to the "Banco de Benfica" assignment. In this case the students applied to the Distributed Design Award in 2022. Image by the authors with all rights reserved.

IMAGE 3. Martins and Silva (2023) Yarn Winder project. Collage and 3D render by authors with all rights reserved.

children with nature, this conceptual robot acts as an emotion translator, turning the needs of plants into emotions to foster empathy towards the environment. Drawing inspiration from games like Cubeworld, Gardy proposes an interactive garden experience, grouping plants by their needs to educate children about biodiversity and plant care.

At its heart, Gardy aims to build an emotional link between children and the garden, using human-like expressions to communicate plant needs in a child-friendly manner. This approach makes gardening engaging and teaches children about responsible consumption and environmental awareness.

Gardy's concept extends beyond the technology, envisioning a collaboration with schools, fablabs, and NGOs to create a network that supports sustainable learning experiences. As a part of the garden's ecosystem, Gardy would collect essential data to alert children to plant care, making sustainability an interactive and hands-on experience.

In summary, Gardy, as a conceptual project, represents a groundbreaking approach to blending technology with environmental education. It stands as a symbol of future innovation in educational settings, where technology and nature coexist harmoniously, nurturing a more sustainable and environmentally conscious generation.

Continuing in the 2022-23 academic year, the Personal or Shared Object Re-Design Project required students to re-design a small-scale, personally significant object for global distribution and local production. This assignment concentrated on the global potential of design and digital fabrication, urging students to consider how technological advancements could impact design customisation and scalability. The re-designed objects produced in this project were meant to be personally meaningful and adaptable for use in various global settings.

The Martins and Silva¹⁴ Yarn Winder project, developed in the Personal or Shared Object Re-Design Project assignment, creatively draws inspiration from cats and their play with yarn balls. This electric yarn winder is designed for efficiency and ease, winding yarn into cakes with minimal effort. Mimicking a cat's stealth and adaptability, it blends into its surroundings without disturbance.

This project aims to provide a cost-effective, DIY yarn winder solution. As a Distributed and Open Design initiative, it allows for customisation and user-driven alterations through accessible online documents. The Yarn Winder exemplifies practical innovation, encouraging community collaboration and customisation in design.

More recently, the "Sun Factory"¹⁵ project represented an innovative venture into Distributed Design. Focused on "SUN POWERED PLASTIC RECYCLING", this assignment explored the potential of low-tech solar tools for locally-scaled plastic recycling.

Emphasising energy-efficient recycling methods, the project aimed to make plastic recycling more accessible and environmentally sustainable. As part of a broader initiative developed by IPL and BY THE END OF MAY¹⁶ under the Distributed Design Platform, it invited creative contributions from students and designers across Europe. The challenge was one of two: - to improve upon existing Sun Factory tools and systems or to conceive new products or services utilising the Sun Factory's technology, aligning with the principles of open, collaborative, and regenerative design. This approach aimed at rethinking how some goods are produced, using global data connectivity to leverage local materials and knowledge and fostering a more sustainable relationship between consumers and products.

Each of these projects, distinct in their approach and objectives, cumulatively represents IPL's commitment to integrating Distributed Design principles into the curriculum, preparing students for a future in design that is sustainable, globally conscious, and locally impactful.

Emerging from the Sun Factory assignment, Gomes and Caneira¹⁷ "Re-Ruler" project represents a collaborative venture with Fundação Cuerama to enhance children's education in Angola. This innovative ruler is designed to be more than just a measuring tool; it transforms into various shapes and sizes for educational engagement. With its ergonomic design and safety features, the Re-Ruler is particularly suitable for children, making learning about geometry and art both fun and interactive.

At the core of this project is an open and distributed design approach, inviting community involvement in production and emphasising the principles of a circular economy. Constructed from recycled plastic, the Re-Ruler by Beatriz Caneira and Inês Gomes highlights sustainability alongside its educational purpose. Its intuitiveness and functionality for children have been validated through prototype testing, showcasing a successful blend of utility, educational value, and environmental consciousness.

Reflecting on the Assignments' Impact

These assignments represent an effort to transition students' perspectives from traditional product design naturally taught in the introductory courses of the BA program to a more inclusive and diverse vision. They aim to extend beyond technical proficiency, encouraging students to contemplate Distributed Design's broader implications and potential in real-world scenarios. The projects aspire to foster a mindset of global collaboration, local production, and sustainable practices.

Introducing Distributed Design values through these assignments intends to contribute to a more

progressive and responsible direction in design education. While these paradigmatic assignments are designed to instil a deeper understanding of Distributed Design principles among students, they are also a part of an ongoing exploration into the evolving landscape of design. Following the effort to adapt the approach to contemporary design challenges, these experiences and methodologies will also inform and possibly influence future directions in design education.

COLLABORATIVE EXHIBITION AS A REFLECTIVE TOOL IN PRODUCT DESIGN COURSES AT IPL - INTRODUCTION TO THE RETROSPECTIVE EXHIBITION

In the academic year 2023-24, an innovative pedagogical tool was introduced in the Innovation Design course (Visual Arts and Technologies BA too) at the School of Education, IPL. This tool took the form of a collaborative class-generated retrospective exhibition, focusing on IPL's participation in the Distributed Design Platform from 2018 to 2023. The exhibition's primary purpose was to serve as a reflective and analytical exercise for students, encompassing both historical and recent projects.

Methodology of the Exhibition

The process of organising the exhibition was methodical and aimed at achieving two main objectives:

1. **Engagement with Past Projects** (generated by the assignments previously described) Students analysed various projects, some of which they were not directly involved in. This process allowed them to gain a broader perspective on the evolution of design projects over the years.
2. **Abstract Writing and Evaluation** The central task for students was to write or adapt abstracts for these projects. They were also required to evaluate the project's alignment with Distributed Design values on a quantitative scale from 0 to 5.
3. **Qualitative Justification** Students also provided qualitative justification for their ratings. This step was crucial in understanding their perception and interpretation of how well the projects adhered to distributed Design values, which demanded critical thinking and a deep understanding of Distributed Design values.

This retrospective exhibition activity served a dual purpose:

1. **Reflective Practice** By analysing and evaluating a range of projects, students engaged in a reflective practice that allowed them to critically assess the work done through the participation of IPL in the Distributed Design Platform. This practice was instrumental in enhancing their understanding of Distributed Design values and their application in real-world scenarios.
2. **Data Generation** The exhibition also served as a valuable tool for data collection. The students' evaluations and justifications provided rich data, offering insights into their perception of Distributed Design and its implementation in design projects.

This retrospective exhibition approach represents a novel and effective method of engaging students in the values of Distributed Design. By critically evaluating past projects, students deepened their understanding of Distributed Design and contributed to a dataset that helps assess Distributed Design principles' impact on their learning and perception. While confined to the context of this specific course, this exercise provided valuable insights into the evolving practices and methodologies in IPL's early design education, particularly concerning integrating Distributed Design concepts.

Methodology of the First Survey

The first survey represented an essential step in understanding the integration of Distributed Design values. The methodology adopted for this survey involved a detailed process where students critically reviewed and condensed project information through:

- **Abstract Writing** Students selected projects, including their own and those they were not directly involved in, from 2018 to 2023. They then condensed the essence of these projects into succinct abstracts. This task required them to distil complex design concepts and processes into clear, concise descriptions.
- **Alignment with Distributed Design values** As part of the questionnaire, students evaluated each project's alignment with the values. They used a quantitative scale ranging from 0 to 5, where 0 indicated no alignment, and 5 indicated strong alignment with Distributed Design values.
- **Qualitative Insights** Besides the numerical scoring, students provided qualitative justifications for their evaluations. This survey aspect was crucial as it offered more profound insights into the students' understanding of Distributed Design values and how they perceived these principles were applied in the various projects.



This process was instrumental in providing a clearer understanding of how effectively the product design courses at IPL had integrated Distributed Design values:

- **Understanding of Distributed Design Principles** The abstract writing and project evaluation process enabled students to articulate their understanding of Distributed Design principles. It also encouraged them to critically assess the application of these values in different design contexts.

IMAGE 4. (Leite 2022) eucalpto stool - A valchromat™ version in the making at Fablab Benfica CNC. Photo by Anastasia Arakelian (all rights reserved)

IMAGE 5. (Martins, Silva, and Figueiredo 2024) dot. stands out in all fronts of our methodology and was one of the finalist projects in the "Sun powered plastic recycling" open call. photo by authors under CC BY-NC-SA 4.0

- **Program Evaluation** The students' evaluations and justifications served as an indicator of the program's success in conveying the essence of Distributed Design to the students. The data collected from this survey provided tangible evidence of the program's effectiveness in integrating Distributed Design principles into the coursework.
- **Reflective Learning** This exercise allowed students to reflect on their learning journey in the context of Distributed Design. It allowed them to reassess their projects and understand their growth in the design field.

After the initial project collection and analysis, a subsequent and more straightforward survey was initiated and involved a voting process by all participating students.

Students voted on the projects previously analysed, aiming to identify the ones they perceived as most representative of Distributed Design values and those that would have a significant impact if included in the exhibition.

The focus of the voting was twofold: to recognise projects that exemplified Distributed Design values and to select those that could effectively convey the essence of Distributed Design if exhibited. This process was critical in gauging the collective understanding and appreciation of Distributed Design among the student body.

Also, a vital aspect of the second survey was its role in cross-verifying the findings from the first survey:

1. **Comparative Analysis** The results of the voting process were compared with the individual evaluations and justifications from the first survey. This comparison was essential to assess the alignment between individual and collective perceptions of Distributed Design within the student projects.
2. **Understanding Collective Perspective** The voting results provided valuable insights into the collective perspective of the students. It helped in understanding what the students, as a group, considered exemplary in terms of Distributed Design project execution and values.
3. **Validation of Individual Assessments** The alignment, or lack thereof, between the two surveys' results was a validation tool for the individual assessments made in the first survey. It offered a broader perspective on how well the students had grasped and applied the values of Distributed Design in their projects.

This voting mechanism played a pivotal role in consolidating the understanding of Distributed Design values among the students at IPL. It provided an opportunity for collective decision-making and offered a platform for students to express their views on what constitutes effective Distributed Design project execution. This process complemented the individual

assessments from the first survey and contributed to a more comprehensive understanding of the integration of Distributed Design values in product design courses.

First Survey Results: How do the Abstracts Collection Reflect the Projects' Alignment with Distributed Design Values?

The first survey results underwent a thorough analysis using a custom R script¹⁸ to gauge the alignment of the projects with Distributed Design values. This process involved:

1. **Project Score Calculation** Projects were evaluated across five Distributed Design categories: openness, collaboration, regenerative, ecosystemic, and production paradigm. Scores were assigned based on the presence of specific keywords in the project abstracts related to each Distributed Design category (Rocha 2024b).
2. **Data Summary and Output** The projects' total scores were calculated by summing the individual category scores. This summary provided an overview of each project's overall alignment with Distributed Design values.

Upon analysing the dataset, specific projects stood out for their high alignment with Distributed Design values. For instance, "dot.", "alquiplus", and "dehipaper" were notable for their high overall scores, indicating a solid adherence to the values such as sustainability, collaboration, and innovative production paradigms.

First Survey Results: How do the Abstracts Collection Reflect the Projects' Alignment with Distributed Design Values?

The second survey involved a voting process, where students selected projects exemplifying Distributed Design values and those impactful for exhibition inclusion. This process served as a cross-validation of the first survey's findings.

1. **Collective Perception Analysis** The voting results reflected the collective understanding and appreciation of Distributed Design among students, providing insight into the student body's shared perspective on the projects.
2. **Comparative Analysis** The comparison of voting results with the first survey's individual evaluations and justifications allowed for assessing the alignment between individual and collective perceptions of Distributed Design within the student projects.

DOT.

Martins, Silva, and Figueiredo 2024¹⁹

"The dot. project aims to enhance the quality of life for individuals with visual impairments, presenting itself as an efficient, practical, and economically viable way to write in Braille. It emerges as an alternative to bulky Braille writing machines and impractical presses due to its meticulous method of use. Proposing an alternative to the reuse of discarded plastic, dot. leverages Sun Factory technology since it uses recycled plastic and consumes no electrical energy.

Dot. is a stamp for marking Braille characters, facilitating communication between individuals with visual impairments and those without. It can also serve an educational purpose, acting as a learning aid for those acquiring Braille writing and reading skills. This object can easily be an expandable tool, usable and/or reproducible anywhere globally, playing a significant role in areas with a high number of visually impaired individuals, as well as in locations with high disposable plastic pollution.

(...) Integrated into the concept of distributed and open design, dot. promotes the sharing of knowledge and interaction with users, as well as with other creators. It is free to be reinterpreted and modified according to emerging needs, creating a constant line of design evolution. Leveraging the communal aspect of distributed and open design, dot. enables the democratization of access to a Braille writing tool, making it available in various contexts, whether they are social, political, humanitarian, etc."

During this voting process, there was a consensus on specific projects that exemplified Distributed Design values. For example, projects like "dot.", "alquiplus", and "dehipaper", which had already scored high in the first survey, were also recognised in the voting process for their exemplary execution of the values. This alignment between the survey results and voting outcomes validated the individual assessments and provided a broader understanding of integrating the values in the students' projects. In summary, the juxtaposition of the first survey data and the voting results¹⁸ from the second survey offered a comprehensive view of the students' understanding

TABLE 1. Extracts from original EN Abstracts, as submitted by students - (Rocha 2024b)

DEHYPAPER

Pereira and Rocha 2024²⁰

"Papermaking with the reuse of paper is a fundamental practice for preserving the environment and conserving natural resources, but drying recycled paper is often a time-consuming and intensive process. Handmade paper drying is a practice that dates back to antiquity and is widely used in various regions of the world, each employing different techniques in response to different climates and traditions. Evidence has been found of methods such as the use of molds in the Far East, "drying-lofts" in Europe, and specific techniques in places such as Nepal, Japan, China, among others.

To address this challenge comes the recycled paper solar dehydrator, an adaptation of solar dehydration equipment designed to speed up the food drying process by using solar energy efficiently and sustainably. This machine is able to capture the sun's heat, keeping it insulated and promoting air circulation to speed up drying, resulting in significant benefits for the environment.

The idea behind the solar dehydrator for drying recycled paper is to harness the sun's energy to speed up the paper drying process.

This product ultimately benefits the environment both by contributing to sustainability and by reducing environmental impact. Heat is used as the main source of energy, a renewable and clean source, which does not emit pollutants or deplete non-renewable resources in its use, unlike fossil energy sources. It contributes to reducing solid waste, meaning less paper is wasted and less waste goes to landfill. It also helps to save natural resources, such as trees, which would be needed in large quantities for paper production processes using natural raw materials.(...)"

and application of Distributed Design values in their design projects. This analysis was crucial in unveiling the depth of the students' engagement with Distributed Design principles and the influence of this engagement on their design methodology and outcomes.

DISCUSSION

Student Perception and Engagement in Distributed Design

The first thread of our narrative is woven from the systematic approach used to gauge the perception of approximately 80 students about Distributed Design's

ALQUIPLUS

Cortinhas, Pinheiro, and Rocha 2024²¹

"(...) The work is part of the technology-based product path, but at the same time it is an expansion of the Alquímétricos concept.

Our proposal aims to articulate concepts housed in the context of distributed and open design - Sunfactory and Alchemétricos.

The Sun Factory aims to decentralize plastic recycling plants collected from beaches, streets, neighbourhoods, i.e. public spaces and/or those subject to the human footprint. Allowing disposable plastic waste to be transformed into new, durable parts. Using only solar thermal energy, without the need for electricity, this factory is a response to inclusive sustainability, making it easier for anyone to renew objects that were in the process of decomposing and give them a new lease of life.

Alquímétricos, which is also part of Distributed and Open Design (...) it also allows the manufacture of low-cost teaching objects and lowers the barrier of access to teaching technology for places with fewer opportunities. These objects encourage the logical construction of three-dimensional products and structures.

integration into their design projects. This approach, as previously detailed, involved students critically reviewing and abstracting projects from 2018 to 2023. The exercise of abstract writing and project evaluation served as a reflective practice and a means for students to articulate their understanding of Distributed Design principles. This process was instrumental in revealing the depth of students' engagement with Distributed Design, offering insights into their perception of its world-changing potential.

However, it is crucial to acknowledge the inherent bias in this evaluation. The prominence of Distributed Design as a core component of their curriculum might influence students' reflections, potentially skewing their perception towards a more favourable view of Distributed Design. This awareness necessitates carefully interpreting these findings and understanding that students' responses are interwoven with their educational experiences and expectations.

Faculty Observations: Evolving Quality and Documentation Practices

The second narrative strand draws from empirical observations made by the faculty over the years. Since integrating Distributed Design principles into the curriculum, student work quality and documentation practices have seen a noticeable evolution. This observation aligns with the strategic shift in pedagogy aimed at transcending traditional design confines, as highlighted in the article's introduction. The faculty's role in observing and guiding this transition has been pivotal, capturing the nuanced shifts in students' approach to design projects.

The correlation between the maturity of the Distributed Design Platform and the improvement in the quality of student projects is particularly noteworthy. The enhanced participation of students in both local and global Distributed Design activities suggests a growing appreciation and application of Distributed Design principles. This increased engagement has led to more sophisticated project outcomes, signaling a successful assimilation of Distributed Design into the students' design thinking and processes.

Connecting the Dots: Synthesizing Student and Faculty Perspectives

Bringing these two narratives together, we observe a dynamic interplay between the pedagogical approach, student engagement, and faculty observations. The introduction of Distributed Design principles has undeniably influenced the students' design thinking, as evidenced by their project outcomes and engagement levels. The students' growing recognition of Distributed Design's societal relevance and ethical implications has added depth to their design approach, resonating with the program's goals of fostering a more holistic understanding of design.

From the faculty's perspective, the transition to a Distributed Design-focused curriculum has not only reshaped the pedagogical landscape but also provided a unique lens through which to observe and assess student growth. The faculty's empirical observations of the evolution in student work and participation serve as a testament to the effectiveness of this pedagogical shift.

Navigating the Evolving Landscape of Design Education

In navigating this evolving landscape, the insights gained from student and faculty perspectives offer valuable contributions to the ongoing discourse on



the future of design education. They highlight the importance of adaptive and responsive educational strategies that align with contemporary design paradigms and broader societal needs.

CONCLUSIONS

This article endeavours to objectively analyse the integration of open and distributed design in early design education, particularly within the Visual Arts and Technologies BA program at the Instituto Politécnico de Lisboa (IPL). Focusing on the pathways forged in Distributed Design education and within the Distributed Design Platform, it critically examines the links between Distributed Design's conceptual underpinnings and its potential role in shaping the future professional landscape for emerging designers.

IMAGE 6. (Martins, Silva, and Figueiredo 2024) dot. first test injection with sun factory system and the first version of their mould. photo CC BY 4.0 André Rocha



Integration of Distributed Design: A Factual Overview

Our analysis has underscored the incorporation of Distributed Design within the curriculum of two product design courses in a multidisciplinary Visual Arts and Technologies BA program. The context of this program is not centrally focused on design, and it encompasses students with varied levels of intrinsic motivation towards design. The introduction of Distributed Design was observed to enrich the conventional understanding of product design, offering students a broader perspective that transcends traditional industry-focused approaches. This enrichment, however, was met with varying degrees of student engagement and understanding, reflecting the diverse academic backgrounds and interests within the program.

Empirical Insights into Methodological Changes and Student Engagement

The study identified two main methods through which Distributed Design was integrated: first, through the adoption of hands-on design and making methodologies facilitated by access to digital fabrication tools at Fablab Benfica (IPL). The second method involved nurturing student awareness of their design work's potential societal and environmental impacts. This dual approach aimed to deepen students' understanding of Distributed Design principles and encourage their application in real-world scenarios.

IMAGE 7. The Fablab as a live and lively classroom, a space for collaboration. Photo by Anastasiia Arakelian (all rights reserved)

The degree to which these methods enhanced student engagement and understanding of Distributed Design varied, indicating a complex interplay between pedagogical strategies and student receptiveness.

The research observed an emerging awareness among students of the broader implications of Distributed Design. This awareness, however, should be contextualised within the educational setting of IPL, where students are at an early stage in their design education. The extent to which this awareness translates into long-term professional and personal impact remains a subject for further empirical research.

Recommendations for Future Research

Acknowledging the limitations of this initial study, future research is recommended to expand upon these findings. Further investigation, including qualitative studies such as interviews and long-term follow-ups with students, would provide more comprehensive insights into the impact of Distributed Design education on student development, career trajectories, and its broader societal implications.

In conclusion, integrating Distributed Design principles within the Visual Arts and Technologies BA program at IPL presents a case study in evolving design education. This study has provided a factual account of this integration, its methodologies, and its initial impacts on student engagement and perception. As Distributed Design continues to gain traction in the broader field of design education, ongoing research and critical analysis will be crucial in understanding its full potential and limitations, ensuring an approach that is both responsive and reflective of the complexities of educating future designers.

Soft Circuits Toolkit

A circuit-building kit that works on air

Project team

Catharina M. van Riet,
Shibo Zou, Johannes T.B.
Overvelde, and Frank L.M.
Delbressine

Organization

AMOLF and Eindhoven
University of Technology

Location

Amsterdam and Eindhoven,
The Netherlands - Europe

Project type

Product, Methodology

PROJECT DESCRIPTION

The Soft Circuits Toolkit allows anyone to prototype fully soft circuits that work on air instead of electricity. The toolkit aims to interest youth in circuit-building, electronics, and engineering and inspire them to become the engineers of the future. The pneumatic circuits can be used to learn about how circuits work in general, but also to create playful and functional soft devices. Because these designs are fully soft and thus safer for humans to interact with, they show great potential in areas such as healthcare and human-robot interaction. The Soft Circuits Toolkit includes a range of components, including those that you normally find in analogue electronics kits. This allows anyone, but especially youth, to playfully and safely experiment with these pneumatic circuits and create their own soft designs.

CONTEXT AND HISTORY

This project started as a thesis research project in the Soft Robotic Matter group at AMOLF in Amsterdam, as part of the Industrial Design master's programme of Eindhoven University of Technology. The initial goal was to interest design and engineering students in soft robotics by giving them a ready-made toolkit for building soft, pneumatic circuits and projects. An additional goal of the project was to give soft robotics researchers a platform to quickly prototype soft circuits and integrate their own designs into this platform because of its modular nature.

During the early stages of prototyping, we discovered that this pneumatic circuit-building approach also lent itself well to teaching circuit-building in general to a wider audience, including secondary school students. As a result of this finding, the focus of the toolkit was shifted slightly, serving mainly as a teaching kit for circuit-building and soft robotics education in schools and universities.

WHAT IS THE NEED IT TACKLES?

In the Netherlands, rates of high school students obtaining a technical secondary school track have been steadily falling since 2017¹, despite personnel shortages rising in engineering fields². This is concerning, especially as we are facing climate challenges that need future engineers to solve. The Dutch government therefore wants to inspire more youth to pursue an engineering career^{3,4}.



Our goal is to spark an early interest in engineering among the younger generation by providing a playful toolkit that teaches about engineering circuits. For very young audiences, we aim to use the toolkit to kindle the children's curiosity about how things work in general, promoting a lifelong interest in problem-solving and creation.

The toolkit also aims to foster critical thinking skills, preparing students for future studies in STEM fields. For students already taking an engineering degree, we aim to interest them in soft robotics and the design of soft devices in general.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Our process included early and frequent communication with the target group (secondary school and university students) to ensure that the toolkit fit their interests and needs. To better understand the target user group, initial informal interviews were conducted with secondary school students to gain a good understanding of their knowledge of pneumatic and electronic circuits. To create a soft, pneumatic circuit system, other circuit-building toolkits were analysed to design the circuit components. Expert feedback was gained through interviews from secondary school and university physics teachers. This feedback, combined with insights from user testing with university engineering students and secondary school students, was used to match the designs and educational materials to the needs and interests of the target user group.

IMAGE 1. The Soft Circuits Toolkit. (1 August 2023. Eindhoven. Christ Clijssen.)



A proof-of-concept toolkit was created that consisted of the physical toolkit and a manual with step-by-step circuit-building instructions. User testing was carried out with this first iteration that evaluated users' perceived self-efficacy in circuit-building before and after using the toolkit. Based on the insights gathered from these tests, further developments and improvements were incorporated, resulting in a second major iteration. An instructional website was also developed. Further user testing was carried out on this iteration, assessing user experience using a validated questionnaire (UEQ)⁵, as well as evaluating the problem-solving potential of the toolkit through several circuit-building exercises designed to test basic circuit understanding.

IMAGE 2. Overview of the circuit-building components included in the toolkit. (1 August 2023. Eindhoven. Christ Clijsen.)

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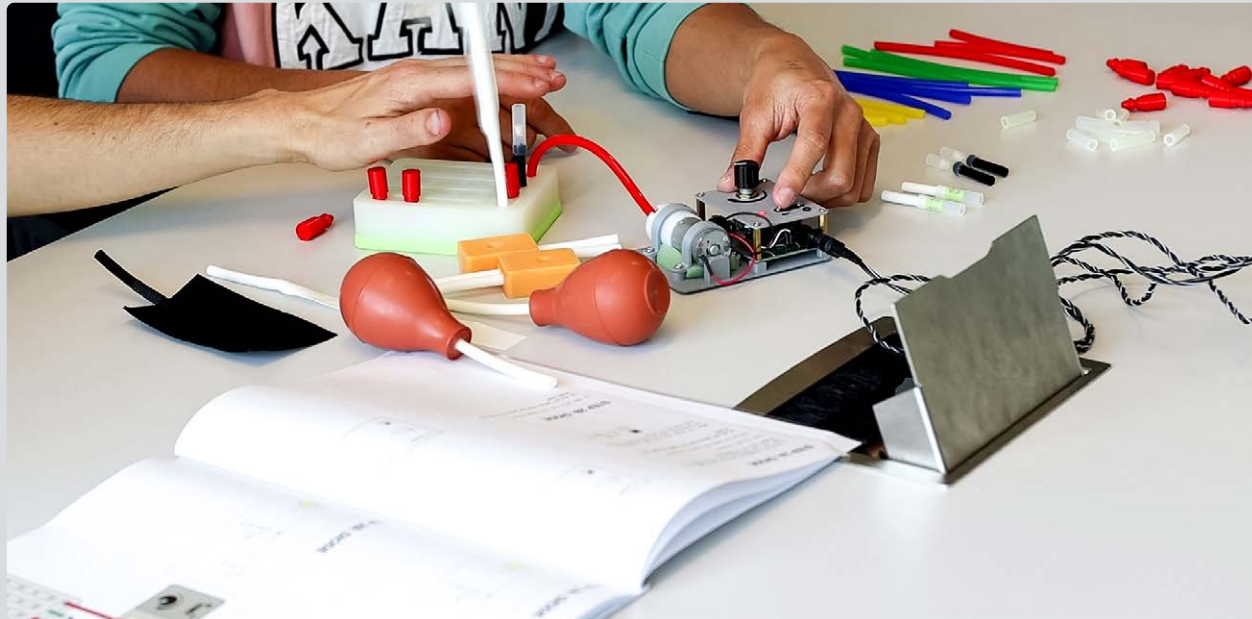
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WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

Youth greatly enjoy playing with the toolkit and even creating their own circuits. They can understand the concept of airflow and apply it to the circuits they are building. Because they can feel the airflow and air pressure, they rapidly form an understanding of the circuits and components. Some students can even further apply this knowledge to building their own circuits. Additionally, because all the components are soft and use air instead of electricity, they are safe for interaction. At interactive demonstration events, children from the age of 5 were also able to work with the toolkit successfully. For these reasons, we expect the toolkit is also suitable for primary school children, and we are working on further testing with this target group.

We hope that the toolkit will inspire users to dive further into design, engineering, and soft robotics more specifically. As a designer, I personally feel that the toolkit is a great way to get a first taste of design that is soft and compliant. It shows that actuation can be achieved through pneumatics, with the design remaining soft in the process. Such an approach can have great potential in human-computer interaction for making robots that are safe and inviting for human interaction, or the design of assistive wearables such as support braces or pieces of clothing that have certain logic functions integrated while still remaining comfortable for the wearer. For designers and engineers, it could be fruitful to incorporate this approach to soft designs into their repertoire, so that they can broaden their design approaches.



WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

Through our website, we show how anyone can build these pneumatic circuits and further expand on them by incorporating existing and newly designed components, as well as designing new types of circuits. In the future, we hope to offer a platform where these component and circuit designs can be shared. We have already included on the website and in the manual circuit designs contributed by users of the toolkit.

WHY IS THE SOFT CIRCUITS TOOLKIT DISTRIBUTED DESIGN?

One of the main goals of our project is to make it completely open source, so that anyone in the world can download the files and make their own toolkit, and even better, contribute their own designs to it. As a researcher, I feel strongly about making the results of publicly funded research publicly available. The first step in this process has been to create a website [\[QRcode 1\]](#), that provides an in-depth look at how the toolkit functions.

However, we realise that not everyone has the capacity to fabricate this toolkit, so we are also looking at commercialisation of the toolkit to make it available to schools and interested individuals.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Any dinosaur that would not have me for dinner. I would like to know what they actually looked like, if they had feathers, and if they were warm-blooded.

IMAGE 3. The toolkit being tested by university students. (4 June 2023. Eindhoven. Katrien van Riet.)

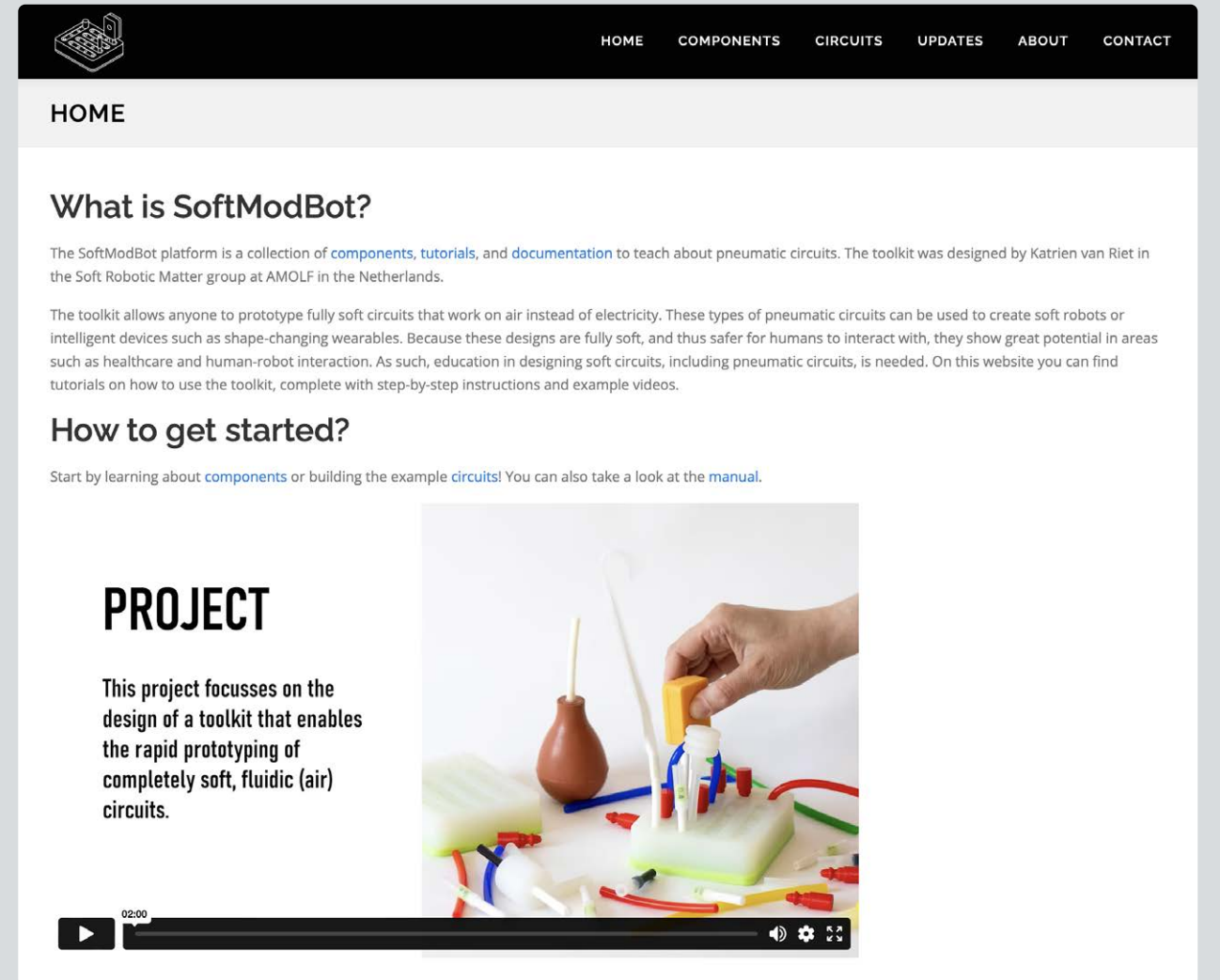


IMAGE 4. The website that accompanies the toolkit, including example circuits, videos showing each circuit in action, information on all the components, and a pdf version of the manual. (30 December 2023. Utrecht. Katrien van Riet.)



Circular Cities Challenge

A week-long challenge that supported young creatives to ideate and prototype circular design strategies for waste material transformation

Project team

Sally Bourdon, Fab Lab
Barcelona at the Institute for
Advanced Architecture of
Catalonia

Organization

Distributed Design Platform

Location

Barcelona, Spain - Europe

Project type

Design challenge

PROJECT DESCRIPTION

The Circular Cities Challenge [\[QR code 1\]](#) was a five-day (July 3-July 7 2023), 40+ hour programme that supported 22 young, local, and international Creative Talents to ideate and prototype circular design strategies to waste material transformation challenges in Barcelona, Spain. In collaboration with key industry partners, design challenges were developed in the areas of food, natural materials, energy, and textiles. The Challenge was carried out between Fab Lab Barcelona and TransfoLab, a local makerspace in the Poblenou neighbourhood of Barcelona, and supported by local instructors and a group of topic specialists.

CONTEXT AND HISTORY

Barcelona, a hub of innovation, design, and knowledge, is gradually embracing regenerative and circular practices that promote resilience and prosperity for all. From upcycling textiles into new designs and food waste into compost, to repairing and upcycling workshops, initiatives are re-defining traditional waste materials as high value products. Over the past 16 years, Fab Lab Barcelona has promoted this transition, particularly through supporting the co-creation of circular solutions around specific societal challenges. The team at Fab Lab Barcelona works to create spaces for citizens to express their needs, design, prototype and experiment with solutions that have a real and valuable impact on their territories.

In 2018, as part of Distributed Design Platform activities, Fab Lab Barcelona joined Precious Plastic to host the Plastic for Good Challenge. At the time, the Fab Lab team developed a 5-day experience-based learning programme on creating innovative products from plastic waste. The Circular Cities Challenge is the second iteration of that learning experience.



IMAGE 1 & 2. A cocktail-hour presentation of the Circular Cities Challenge at the Cultural & Creative Industries Event at Barcelona's CosmoCaixa (July 2023, Barcelona, Fab Lab Barcelona)



WHAT IS THE NEED IT TACKLES?

Now more than ever, young folk entering the creative and cultural industries need the tools to understand, design, and implement the circular economy, while industry leaders need to recognise the potential of Creative Talents as key drivers of circular principles in cities and regions. The Circular Cities Challenge therefore had six objectives:

1. Boost Creative Talents' skills and knowledge to help them reach new and emerging markets presented by the Circular Economy
2. Boost the role of designers and Distributed Design in the implementation of Circular Economy in cities and regions
3. Make the Circular Economy tangible in the urban context of cities and regions through physical products and artefacts designed with and for citizens
4. Boost the inclusion of design-thinking in the implementation of the circular economy in Europe in particular to reach the general public
5. Bring awareness to Barcelona's local context and the potential to adapt global knowledge to develop local solutions
6. Integrate the Distributed Design Platform values (open, collaborative, regenerative, and ecosystemic) into every step of the design process

IMAGE 3. The natural materials team begins exploring their material, humxn hair, provided by Valerie Itey, of ClicRecycle (July 2023, Barcelona, Fab Lab Barcelona)

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

The goal was to propose an innovative and experience-oriented programme for Creative Talents, with a particular focus on skill development for designing for the circular economy. Programme development and implementation was led by Fab Lab Barcelona and followed the team's learning ecosystem approach. This methodology addresses attitude, challenges, and knowledge transfer through instructional, guided, and autonomous learning stages, respectively. Additional insight was provided by experts on circular economy, design, and the maker movement within and beyond the Distributed Design Platform.

22 Creative Talents from 13 different countries were selected through an open call to participate in the Circular Cities Challenge. Talents were split into groups, with each group addressing one waste material transformation challenge. The challenges were co-designed between Fab Lab Barcelona and local industry partners. Due to both local cultural significance and global efforts to implement circularity, the programme focused on challenges from four industries: food (with Mercabarna), energy (with Universitat Politècnica de Catalunya-EIT InnoEnergy Masters in Energy for Smart Cities), textiles (with Reimagine Textile and RMT S.A.), and natural waste (with Materfad and Clic Recycle).

The week itself began with teams meeting their respective challenge during visits hosted by the industry partners. Throughout the rest of the week, the Creative Talents collaboratively ideated and prototyped proposals using a combination of approaches and processes including digital fabrication, traditional crafts, electronics, and biomaterials. Teams were supported with facilitation sessions and specialists in each topic, while fabrication took place between Fab Lab Barcelona and TransfoLab. At the week's end, the groups presented their circular design strategies to the facilitation team, industry partners, and interested folk.



IMAGE 4. Energy team member, Stella Schindler, solders electronics with support from Fab Lab Barcelona staff, Adai Suriñach (July 2023, Barcelona, Fab Lab Barcelona)



IMAGE 5. Monica Pinto Sanz explains the food team's work at the Cultural & Creative Industries Event (July 2023, Barcelona, Fab Lab Barcelona)

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

Overall, the Challenge highlights the potential for Distributed Design and its practitioners to support the implementation of the circular economy. The programme also empowered young designers to showcase their creativity, problem-solving, and potential to shape a more collaborative and regenerative future for cities and beyond. Lastly, the prototypes Talents developed serve as interactive and replicable examples of the circular economy that encourage industry, policy makers, and citizens to envision alternative responses to traditional waste challenges.

To bring these outcomes to a broader audience, the Circular Cities Challenge was documented in a short film. The Challenge was also presented to over 100 leaders in the cultural and science fields at Barcelona's science museum, CosmoCaixa, and the Barcelona's Design Hub, as part of the Cultural & Creative Industries Event. A week-long exhibition of the Challenge, designed by Fab Lab Barcelona, received hundreds of interactions while it was featured at CosmoCaixa. Lastly, the Challenge will be featured in an upcoming e-book created by the Spanish Foundation for Science and Technology, further connecting audiences in the creative and technological fields with the concept of Distributed Design.



IMAGE 6. Creative talents explore the humxn hair prototypes at the Challenge's final showcase (July 2023, Barcelona, Fab Lab Barcelona)

IMAGE 7. Creative Talents exchanging during a warm-up activity at Fab Lab Barcelona (July 2023, Barcelona, Fab Lab Barcelona)

TEXTILES

Anna Cain
Davide Onestini
Carolina Forss
Carla Molins Pitarch
Marielle Wall
Lucy Bowen

Challenge

Reimagining the value of Spanish wool waste into new, high value composite materials

Response

Moduwool is a modular felted wall panel made from waste wool and left-over compostable grocery bags.



FOOD

Janine Leahy
Sara Reichert
Daniiil Chechin
Mathias Charles
Monica Pinto Sanz
Alysha Vergis

Challenge

Extending the lifespan of the fruit and vegetables on display at Mercabarna's Central Fruit and Vegetable Market stalls.

Response

SPY, a shelf life monitoring device for vendors, measures live data on temperature, humidity, pressure, and volatile organic compounds, all key factors in fresh food decay.



ENERGY

Chiara Scialdone
Stella Dikmans
Stella Zoe Schmidler
Alina A. Karl

Challenge

Matching energy generation with consumption in the context of communities inside the city.

Response

UP2US aims to address the problem of unused hours at the community level. An installation in public space makes people aware of the Energy Mismatch, encouraging behaviour change.



NATURAL MATERIALS

Paola Zanchetta
Siyu Liu
Suwapat Rodprasert
Josephine Bourghardt
Veronika Róza Háló
Laura Subirats

Challenge

Combatting cultural taboos by developing creative and open applications of a renewable and abundant but unjustly ignored resource: humxn hair.

Response

Cooking Hair explores the potential of using hair by experimenting with open source recipes for bio materials, aiming to inspire others to further research the potential of working with humxn hair.



WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

Participants based in Barcelona and across Europe, and with origins from around the world, participated in the Challenge. Talents brought their global knowledge to the local context, adapting to the needs of the localised challenge while also exchanging knowledge between them. After the Challenge, Talents brought their experiences back to their own environments, creating opportunities for further adaptations and knowledge sharing based on distributed design and circular economy principles.



WHY IS THE CIRCULAR CITIES CHALLENGE DISTRIBUTED DESIGN?

The Circular Cities Challenge put Distributed Design principles into practice: Creative Talents collaboratively used their global knowledge and experiences to explore responses to local challenges. Both Creative Talents and Fab Lab Barcelona openly documented their work, facilitating the redistribution of knowledge to new contexts. Moreover, the Platform values were integrated throughout the programme, from Talent selection to ideation sessions and prototype presentations. Lastly, the physical artefacts the Talents developed symbolise an ethos of making based on local production and materials. They serve as a source of inspiration, empowering communities to discuss and envision a plurality of responses to traditional design challenges.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Methuselah, the ancient Great Basin Bristlecone Pine, who is thought to be the oldest tree in the world (an estimated 4,853 years old). We would like to hear about their experiences, how they've seen the world change, and how they think we humxns might design with other species for a more collaborative and regenerative present.

IMAGE 7. Lucy Bowen works on the textile team's prototype, ModuWool, made from wool that would be otherwise wasted (July 2023, Barcelona, Fab Lab Barcelona)



IMAGE 8. Creative talents explore the humxn hair prototypes at the Challenge's final showcase (July 2023, Barcelona, Fab Lab Barcelona)

Africa Open Science & Hardware (Africa OSH)

Africa OSH is a grassroots movement that promotes open science and open hardware initiatives across the African continent

Project team

Frank Bentum

Organization

Africa Open Science & Hardware

Location

Kumasi, Ghana - Africa

Project type

Community

PROJECT DESCRIPTION

Africa Open Science & Hardware (Africa OSH) is a grassroots movement promoting open science & open hardware initiatives across Africa. Africa OSH is a community that fosters collaboration, knowledge sharing and the development of open-source tools and technologies to address local challenges.

The Africa OSH Community brings together scientists, makers, makerspaces, researchers, educators, students, and enthusiasts who are interested in open approaches to science and technology, with the aim of democratising access to scientific knowledge in Africa.

CONTEXT AND HISTORY

The idea of Africa OSH emerged from discussions between Thomas Mboa of APSOHA and Jorge Appiah of Kumasi Hive at the 2017 Gathering for Open Science Hardware in Santiago, Chile. They were interested in exploring Africa specificities in the maker movement and decided to open the conversation to a larger audience. Connie Chow of the Exploratory came on board during the MIT Bio Summit in 2017 in Boston and Gameli Adzaho of the Global Lab Network was later invited.

The maker movement is growing in Africa, much like the rest of the world. Fablabs, makerspaces, co-creation spaces and open innovation spaces are multiplying. However, it seems what happens on the continent is a duplication of what has been done in the West and elsewhere. Africa OSH therefore seeks to open a conversation, by and for Africans, on how to benefit from the maker movement, open science and open hardware, from our own social, cultural, political and environmental realities, yet connecting with the bigger picture.



IMAGE 1. Africa OSH Summit 2019 (April 2019, BongoTech Lab, David Amfo Kwakye)

WHAT IS THE NEED IT TACKLES?

Access to scientific knowledge

Africa OSH seeks to promote open practices in science, making scientific knowledge more accessible to individuals and communities across the African continent.

Education & Capacity Building

Africa OSH is involved in initiatives that are dedicated to developing the capacity of individuals in open science and hardware. This includes trainings, workshops and educational activities to empower people with the skills and knowledge to participate in open science endeavours.

Creating a community for collaboration

Africa OSH seeks to create a collaborative ecosystem where individuals and communities can work together on open science projects. This collaborative approach helps in pooling resources, sharing ideas and collectively addressing local challenges well beyond individual capabilities.



WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

The idea of Africa OSH emerged from discussions between Thomas Mboa of APSOHA and Jorge Appiah of Kumasi Hive at the 2017 Gathering for Open Science Hardware in Santiago, Chile. They were interested in exploring Africa specificities in the maker movement and decided to open the conversation to a larger audience. Connie Chow of the Exploratory came on board during the MIT Bio Summit in 2017 in Boston and Gameli Adzaho of the Global Lab Network was later invited.

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

Since its inception in 2018, Africa OSH has successfully hosted three (3) summits, which have brought together all local and foreign enthusiasts of open science hardware, starting conversations on how open science hardware can be adopted in the African context, creating a large local community of OSH enthusiasts committed and dedicated to the widespread adoption of open science hardware in Africa and also developing educational and capacity building initiatives for OSH, equipping people with the skills and knowledge needed to participate in open science endeavours.

IMAGE 2. Africa OSH Open Hardware Workshop (June 2023, Kumasi Hive, Jeffrey Owusu)



WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

Africa OSH fosters a relationship between the local and international open science hardware community. The movement provides the opportunities for networking and collaboration and ensures that the African perspective is well represented at the global level. The Gathering for Open Science Hardware and its forum are global platforms where local OSH instruments can be shared with the global OSH community and practitioners, while the annual Africa OSH Summit is a global platform where local OSH practices and practitioners converge at a global level.

WHY IS AFRICA OSH DISTRIBUTED DESIGN?

The Africa OSH movement supports and fosters distributed design principles in the context of open science and hardware. It involves collaboration on the design and development of scientific tools, hardware and technologies, with the goal of making these resources accessible and adaptable to various local contexts.

If I could have dinner with anyone, I would have dinner with my Mom. She passed away when I was two years old and I would love to have dinner with her and get to know her.



IMAGE 3. Africa OSH Summit 2019 (April 2019, BongoTech Lab, David Amfo Kwakye)

Crafting Inspirational Spaces

Shaping Classrooms to foster Maker Education

By Julia Leirado, Santiago Fuentemilla, Xavier Domínguez from Fab Lab Barcelona



The goal of every school and educator should be to prepare students for present and future challenges by providing transformative opportunities for their pupils and fostering qualities such as critical thinking, engagement, responsibility and creativity. Every student, classroom, educator, and learning community is unique. Learning spaces designs should be, too.

TECLA is a pedagogical research project developed by Fundació Diversa and Fab Lab Barcelona within the Catalan context of primary education (8-12 years). It supports high and maximum complexity schools undergoing transformation towards meaningful and experiential learning. The level of complexity of schools in Catalonia is established on the basis of four criteria: the parents' level of education, the parents' level of employment, the level of immigration to the school, and the percentage of pupils with learning difficulties or newcomers. Socio-economic and cultural inequalities have a huge impact on academic performance^{1,2}. At the same time it is well known that Science, Technology, Engineering, Arts, and

Mathematics (STEAM) skills have a high employability and income rate, so increasing its accessibility is crucial. Therefore, TECLA's project focuses on helping schools in disadvantaged areas to structure their educational project to ensure that their students have access to knowledge and skills in STEAM disciplines.

The project aims to promote and evaluate the improvement of primary school students' understanding, confidence, and application of Science, Technology, Engineering, Arts, and Mathematics concepts in their daily lives while promoting equity, inclusion, and social justice. TECLA assists school administration and staff in creating learning environments that encourage project-based learning and measures its impact on students' learning over a period of 3 years.

IMAGE 1. Collaborative paper circuit constellation (2022. Voramar's classroom. TECLA.)



Support, advice and guidance to schools

Working with school administrators to help them formulate their own definition of STEAM and plan a long-term strategy to shape their educational project, so that they can implement STEAM and Maker activities in the way that works best for their own reality, allowing them to consolidate it within their framework. It will also help them to break the boundaries of the learning process by extending it beyond the classroom, by helping them to identify and develop new relationships with institutions, associations and different stakeholders that can contribute to the learning process.

TECLA's approach uses both the principles of Maker education, which emphasises active learning through hands-on experience, exploration, reflection, autonomous learning, cooperative work and the 5E instructional model (International Science Teaching Foundation) to introduce digital fabrication and technology in the classroom in a meaningful and coherent way.

These school journeys represent a deep transformation that can only be achieved through a multi-scale strategy that targets as many dimensions as possible. We have divided the strategy into three main blocks:

Demystifying STEAM and Maker Education

Embedding STEAM and Maker Education opportunities into the culture of the school, both through general training for all staff to be inspired by the possibilities it can bring to their classrooms, and through more in-depth technical training for a few teachers who can act as technical knowledge hubs for the rest of the school.

Co-design of teaching materials and interventions

Working hand in hand with teachers to jointly develop didactic materials to be used in the classroom. These activities are curriculum needs adapted with a STEAM and Maker Education perspective that they will implement in the classroom. They will also work to understand their contextual needs and complexities in order to create new learning and assessment tools that can be easily adapted to their students in the learning process. Ongoing communication and feedback is key in this block, to know what is working and what is not, and to be able to adapt the nature of the activities as they progress.

IMAGE 2. Molding and casting workshop with 12 years old (2019, Fab Lab Barcelona)

The three blocks are not a static structure; instead, there is a continuous effort to improve and refine them. Since the project's inception in 2021, new ideas have been added to each block based on research to determine if they can enhance student engagement and improve the learning process. One of these ideas was the role of physical spaces in supporting the learning process. As a result the following questions that will be the focus of this article were made: "Does where we learn affect how we learn?" and "Could the physical space itself become a source of creativity and inspiration for maker education?"

The fields of architecture and interior design have been working on the first question for many years through the theme of "Science of Learning Environments". Several studies have concluded that the organisation of physical spaces has a major impact on learners' performance and tends to influence and regulate their behaviour^{3,4}. Environmental factors such as light, noise, temperature, and air quality⁵ are among the most researched parameters that affect learning and have been shown to have a huge impact. However, there are other space-related features such as individualization and the level of stimulation to which students are exposed, that can also affect the learning experience to varying degrees, as we can see in the following table from one of the studies⁴.

TECLA's approach to learning environments focuses on addressing the second question: "Could the physical space itself become a source of creativity and inspiration for maker education?". The goal is to transform existing classrooms using simple and cost-effective interventions that foster curiosity and creativity for maker education while also promoting engagement and learning. Due to financial and political constraints, most schools are unable to demolish and rebuild their facilities to incorporate considerations for light, noise, temperature, and air quality into their layout. Therefore, solutions that do not require construction work are necessary.

Proportion of increase in pupils Overall Progress accounted for by each of the environmental factors.	Design principle	Environmental Parameter	Proportion (%)
Table from "The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis, Building and Environment" ⁴	NATURALNESS		49%
		Light	21%
		Temperature	12%
		Air Quality	16%
	INDIVIDUALIZATION		28%
		Ownership	11%
		Flexibility	17%
	LEVEL OF STIMULATION		12%
		Complexity	17%
Colour		11%	

METHODOLOGY

The project's methodology consists of five main strategies.

- 1. Evaluate** To ensure a functional space, it is important to have a reflection process together with the teachers to understand how the space is being used and to discuss which should be the requirements and gaps that need to be addressed. The learning space should be tailored to the unique needs of each classroom, educator, student, and learning community.
- 2. Sectorize** Gives clarity to spaces and helps children learn where to find things. Finding a well delimited space, that is contained and specific for the following areas:
 - Tools and materials
 - Display space
 - Knowledge and reference materials
- 3. Qualify** Enabling sectorised spaces to best serve their purpose, always seeking to encourage creativity and curiosity, by treating the spaces with their own purpose in mind and adding new and inspiring items.
- 4. Reuse** Reusing as much of the existing classroom and available school furniture as possible in the new layout is both a cost effective strategy and a sustainable one.
- 5. Digital fabrication** using these technologies, such as 3D printing and laser cutting, to design new materials for the classroom allows for customisation that would otherwise be difficult to achieve. They also allow existing furniture and materials to be hacked to meet new and specific needs.



EXISTING INSPIRATIONAL SPACES: FAB LABS AND MAKERSPACES

Fab Labs and Makerspaces are very inspiring environments where different kinds of learning coexist and take place at the same time. In 16 years of educational experience at Fab Lab Barcelona, we have seen how courses and programmes such as Fab Academy or Fabricademy benefit from the creative potential of physical spaces. Exposure to unfamiliar materials and technologies, and observing how others solve problems differently, can drive personal learning and take projects to a higher level. The display of other people's ongoing projects using a variety of materials and technologies, and the arrangement of previous projects on the walls, provides inspiration and stimulates the creative process. The storage of tools and materials, as well as free access to machinery, allows for the development of technical independence.

TECLA's approach to redesigning physical classrooms is to apply the most significant lessons learned from Makerspaces as effectively as possible within an existing classroom. This is based on the experience of Fab Lab Barcelona with learning in such places, as well as on studies that show that individualisation and stimulation have a positive impact on student performance⁴.

IMAGE 4. Fab Lab Barcelona learning environment

TOOLS & MATERIALS

The essential reference document for considering the requirements to build a Makerspace or Fab Lab is the Youth Makerspace Playbook from Maker Ed⁵. While it provides the necessary tools to shape a strategy to set up a full Makerspace, it also has very interesting insights on how to transform a classroom into a creating a space that encourages making and creativity. It includes a comprehensive chapter on tools and materials, as they can be a big source of inspiration and empowerment. "Although children possess an inherent talent for recognizing the creative potential in almost anything, providing them with new materials and tools can facilitate empowering experiences. Great tools not only unlock the potential of materials, they provide an empowering extension of self and creativity."⁶ Classrooms and schools are places of creation, as creativity is inherent in children's nature. However, the materials and tools available to them from the age of 3, when they enter kindergarten, to 17-18 years old, vary very little, even though the tools themselves have the potential to become learning materials. There are some exceptions, such as cutting knives and certain power tools, that may or may not be introduced to teenagers in certain centres, but mainly there is very little variation in the availability of materials and, most importantly, in how they are used.

The potential for creativity using cardstock, paper, plastiline, felt and foam is vast. However, these materials can become monotonous over time and may not provide the necessary support for rapidly prototyping ideas or more ambitious projects. By combining them with new materials, tools, and perspectives, they can once again become a source of raw potential. New materials may come in different forms and shapes, and often involve repurposing items while removing them from their original use and context. Natural materials, such as sticks, rocks, and leaves are also a great option to stock the classroom. Cardboard, in particular, is a very versatile and widely available material, especially in our current online buying culture. It can be used to construct rigid structures and mechanical moving parts. When combined with dowels, it can be used to build unimaginable constructions.

When researching potential new tools for the classroom, it is important to keep in mind the age of the primary school students that TECLA targets. Makerspace and Fab Lab tools include a wide range of hand equipment, such as those for joining, fixturing, cutting, electronics making, and textiles. However, not all of these tools may be necessary and adequate in the primary school classroom. The Internet has enabled teachers worldwide to share their personal experiences using all sorts of different tools. Combining this with other resources, such as the tool list from Makerspace Playbook: School Edition

⁷, has been essential in compiling a list of tools to enhance the making process and improve outcomes in the classroom.

Equipment lists are as individual as the teachers and students themselves, they should always be evolving documents based on trial and error. We have included examples of tools that teachers that want to begin promoting making in the classroom using affordable and accessible materials such as cardboard, dowels, and thin wood should consider. This is just the starting point for working with structural materials in the classroom, which are difficult to use without the right tools, to take students' making results to the next level.

TOOLS FOR CUTTING

Canary knife

This is a knife made for "sawing" cardboard. It allows for a very clean cut and to shape curves with a lot of precision. On top of that it is very safe for children to use as its cuts are similar to paper cuts. Their main issue is that they are not widely available and it can be a bit tricky to get your hands on a fair amount of them, but totally worth it.

Canary scissors or first aid scissors

Canary has a scissor option for cutting cardboard, although a bit pricey. A good alternative are first aid scissors that can easily be found and would do the trick. These are not as good as the Canary knife for cutting curves.

Rotatory electric scissors

These are needed in any school that aims to promote cardboard collection from families, which is a great option for both saving and recycling. Usually cardboard will be brought to the classroom in the way it has arrived at the homes: as a box, which can be tricky to store. To reduce them to flat pieces ready to use and much easier to store, these scissors are fundamental, easy and fast cuts. Even though it is a more threatening tool than the previous ones, with the proper training and supervision it could be used by older children, but honestly its biggest potential is for the teachers and material supervisors to break boxes down.

Multi angle miter shear cutter

This is a tool mainly for teachers, but it will give the making capabilities of the classroom a big push. It allows users to cut popsicle sticks to length and in angle, and also cut wood dowels with little effort, to name a few examples.

TOOLS FOR JOINING

Hot glue gun with glue sticks

This is definitely not a new tool, but sometimes teachers are reluctant to let younger kids use them. With the right support they can be used throughout all primary and definitely from 3rd grade on. Used to make quick fixings in three-dimensional constructions.

Crop-a-Dile hole puncher with zip ties and screws and nuts

Hot glue can make things look messy very quickly, that is why dry fixtures should always be encouraged. This hole puncher has strength enough to punch popsicle sticks which is ideal for mechatronic building. Using zip ties or screws and nuts to tie two pieces through a hole is a perfect option to build 3D structures.

Make do fastener with Make do screws

Make do kits are an amazing option for building 3D structures. The screws hold very tightly 2 or more pieces of cardboard, it is a very intuitive tool to start building bigger cardboard prototypes.

Manual hand drill with zip ties and screws and nuts

when using harder material as thin wood, the Crop-a-Dile hole puncher might run short, in this case a manual hand drill can fix this very quickly. It is a cost efficient and a bit less threatening option to power drills that create a lot of options for classroom making.

WORKING TOOLS

Set of screwdrivers

Screwdrivers are an essential tool for working with screws and nuts. Additionally, dismantling objects to understand how they work is a great way to encourage tinkering. In this task, screwdrivers are a crucial requirement.

Set of pliers

A set of pliers is a versatile addition to the classroom, as it allows for cutting, fastening, holding pieces.



IMAGE 5. Tools for cardboard and wood prototyping (2024, Fab Lab Barcelona)

**CANARY KNIFE**

Cutting

Aim for

Students

Used by

Low

Level of supervision

5-10

Amount/ class

€€€

Price investment for a class**CANARY/ FIRST AID SCISSORS**

Cutting

Aim for

Students

Used by

Low

Level of supervision

5-10

Amount/ class

€€€

Price investment for a class**ROTATORY ELECTRIC SCISSORS**

Cutting

Aim for

*Teachers

Used by

Medium

Level of supervision

1

Amount/ class

€€

Price investment for a class**MULTI ANGLE MITER SHEAR CUTTER**

Cutting

Aim for

*Teachers

Used by

High

Level of supervision

1

Amount/ class

€

Price investment for a class**HOT GLUE GUN**

Cutting

Aim for

Students

Used by

Low

Level of supervision

5-10

Amount/ class

€€

Price investment for a class**CROP-A-DILE HOLE PUNCHER**

Cutting

Aim for

Students

Used by

Low

Level of supervision

5-10

Amount/ class

€€

Price investment for a class**MAKE DO FASTENER AND SCREWS**

Cutting

Aim for

Students

Used by

Low

Level of supervision

5-10

Amount/ class

€€

Price investment for a class**CANARY KNIFE**

Joining

Aim for

Students

Used by

Medium

Level of supervision

1-5

Amount/ class

€

Price investment for a class**CANARY/ FIRST AID SCISSORS**

Joining

Aim for

Students

Used by

Low

Level of supervision

50-100

Amount/ class

€

Price investment for a class**ROTATORY ELECTRIC SCISSORS**

Joining

Aim for

*Teachers

Used by

Low

Level of supervision

50-100

Amount/ class

€

Price investment for a class**MULTI ANGLE MITER SHEAR CUTTER**

Working

Aim for

*Teachers

Used by

Low

Level of supervision

3-10

Amount/ class

€€

Price investment for a class**MULTI ANGLE MITER SHEAR CUTTER**

Working

Aim for

*Teachers

Used by

Low

Level of supervision

3-10

Amount/ class

€€

Price investment for a class

*Teacher: students with the proper training and supervision could end up using them.

STORAGE PRINCIPLES

Some of the tools and supplies listed above can help students approach material possibilities differently and construct more complex structures. However, if they are not used during the making time, their creative potential may go to waste. Tools and materials intended to inspire creativity should be stored in a way that reminds students of their availability. For example, if a quick attachment is required and zip

ties would serve, they should be visible and easily accessible. This ensures that the idea comes up.

Proper storage of tools and materials is essential for their accessibility and visibility, and therefore their use. Having a storage system that students understand and implement is also crucial for controlling chaos, very necessary in maker environments. Pegboards

are a popular choice for tools in Makerspaces and Fab Labs as they provide easy access and visibility. Bins are also a great option for storing supplies when wall space is limited. It is important to organise them in a way that helps students navigate through the different options available. Clear bins, where the contents are visible, are particularly useful. Labelling is crucial, especially when combined with pictograms, to ensure that children who have not yet mastered reading and writing skills, as well as students with functional diversity, can understand. Accessibility not only refers to the ability to navigate through the location of different tools and materials, but also to reach them. For example, the height of the pegboard is important; it should be hung at a height that allows students to reach even the higher spots, as should the bins.

DISPLAY AREA PRINCIPLES

Visibility should not only be addressed for tools and materials, student's projects and work should also be thoughtfully displayed. This promotes student autonomy and allows them to continue working on ongoing projects during free time. Past projects should also have a space in the classroom, despite potential space limitations for storing finished items. They can help develop students' identity as makers, which is crucial for relating to the act of making and even, in some cases, STEAM areas in a positive way. Educators commonly wish to instil a sense of 'I can do that' in students, and displaying past work can be a step in that process. Pride in one's own work and empowerment are closely related feelings that can both be enhanced by something as simple as showcasing previous projects. The advantage is that these works do not need to be as accessible as tools and materials. Therefore, a high floating shelf could be an option for this exhibition. It is essential to approach this showing from a curator's perspective. Studies have shown that taking ownership of the space can increase performance, but also that a very busy environment can be counterproductive⁴. A balanced aesthetic sense should be used when exhibiting work.

Having a designated space to document the learning process in the display area can help consolidate knowledge. It is beneficial to have a physical space where students can visually express their thoughts and learning process, facilitating engagement with the studied subject. This area should also serve as a central location for the group's questions and hypotheses, ensuring visibility for all and allowing for updates throughout the learning journey. The space should also feature a moodboard with inspirational images, which is a widely used tool in design. Additionally, it should provide a place for students to collect information and news related to the project outside of school. This will make learning more

relevant beyond the classroom walls and encourage students' curiosity about the topic.

SECTORIZATION PRINCIPLES

The sectorization process begins with the identification of a specific space for each area, as far apart from each other as possible. Colour coding and the use of titles can also help with the visual identity of each area. For example, deciding that blue will be the reference colour for tools and materials and using this colour to create some blue titles above the area, having blue hooks on the pegboard and using blue labels for the bins will ensure a colour block identification with the function. The other two areas should have two different colours, for example red for display and green for reference, making visual identification of them easy for the students.

USE OF DIGITAL FABRICATION

All three main areas (tools & materials, display space, and knowledge & reference) can benefit from the use of digital fabrication to assist with sectorization. Cutting vinyl letters to name each area allows for professional looking titles and makes it easier to use specific colours, choosing from the wide range of vinyl colours available. Pegboards can be completely fabricated using laser cutting and 3D printing, allowing for a custom design to fit the space available. 3D printing is also very useful for creating pieces that can hold large honeycomb boards together and easily create a moodboard space. It can also be used to design and produce hooks that can be attached to desks to hang students' rucksacks to free up floor space. CNC, although not as widely available as the other two technologies, offers the opportunity to create bespoke furniture, such as storage drawers.

When adapting classroom space to make it more conducive to maker education and creativity, the digital fabrication technologies chosen should be the most accessible and affordable. 3D printers are becoming a very common tool to have in a school, so they seem the most logical to make items and elements to hack the classroom. Vinyl cutters can also be useful in this process for labelling rooms and storing materials. There are some vinyl cutting machines that are very affordable and are a great digital fabrication tool to incorporate in any school, as they allow students to work with a wide range of materials such as vinyl, cardstock, some types of fabric, thermo-adhesive vinyl. The last digital fabrication tool to consider for this process, at a lower level, is laser cutting, which is not as common to find in schools, but is starting to become not so rare.

CASE STUDIES

This section describes the small study cases that have tested parts of the methodology in three of the schools participating in TECLA. During these three years, reflection on the potential of spaces as sources of inspiration has evolved, and each of the tests has focused on different areas.

Escola Voramar, Barcelona

The Voramar school is an unusual example: it does not fit the scope of TECLA schools as it is not a fully public school and is not located in a vulnerable area. In the first year of the project, Voramar served as a pilot to test the methodology in a more controlled environment and as the test lab, we evaluated the spatial methodology, as well as the rest of the project scope.

Voramar's classroom was small and crowded with old desks taking up much of the floor space. A large whiteboard on one wall served as the projector screen, and there were shelves with many books, one of which was hanging on the wall close to some of the children's backs. Additionally, there were scattered cork surfaces for displaying work, most of which were too high for the children to reach.

Interviewing the teacher was a crucial part of the process to understand how the space was used on a daily basis, allowing a decluttering process to happen, key in such limited spaces. For example, there was a bookcase full of dictionaries that were used very sporadically by the students, and could be stored in the multipurpose room next door until needed. We got rid of anything that was not essential, and rearranged the furniture to optimise spatial use and help sectorization, maintaining the three main areas: tools and materials, knowledge and consultation, and display area.

The Tool and Material area was shaped using two of the existing selves and laying them one next to the other, filling them with clear boxes containers properly labelled where the new material was stored. On the top part a pegboard was fabricated using 3D printing and laser cutting to tailor to the available dimensions. The design considered adding a floating shelf above the pegboard to leave some place for storing stuff that was not used daily.

The Knowledge and Reference area was left as it was, with only the unused material removed and the shelving that was obstructing circulation by being very close to some students' seats repositioned. They were also filled with new reference books on STEAM areas and maker processes.

Finally, for the Display Area, the idea was to design something multifunctional to take advantage of the limited space. We tested a flexible mood board that could be moved to the tables to support the learning process of the student groups and then returned to the wall at the end of the activity as a display of the learning process. It was made with cardboard and felt.



IMAGE 5 & 6. Tool and material area underconstruction in Voramar's case study (2022. Voramar's classroom. TECLA.)



IMAGE 7. Display modules in Voramar's case study (2022. Voramar's classroom. TECLA.)



Institut Escola Rafael Alberti, Badalona

Rafel Alberti's case focused on improving the mood board for documenting collective learning. The design of Voramar's mood board had some issues that needed addressing while retaining its multifunctional nature. Voramar's experience showed that the solution intended to function effectively both at the individual group level and for the entire class was not entirely successful.

Rafael Alberti's classroom used to have lockers, but they had been removed some time ago, leaving an opening in the wall that seemed perfect for the moodboard. After understanding the use of the classroom and identifying the current furniture that could be removed from the space, there was a measurement process to create the new moodboard design.

The objective was to create a display element that could be relocated within the school premises and also provide storage space to the classroom. Additionally, it was intended to serve as a platform to document the learning process and project information. To achieve this, four separate wooden structures were constructed, which could be joined together. Each element held a honeycomb cardboard panel measuring 1200×600mm, providing a total flat surface of 1200×2400mm. This surface can be used by the teacher to reinforce the documentation of the learning process. The design also allows for the storage of containers that the school already possesses.



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IMAGE 8 & 9. Rafael Alberti's display classroom with and without the new display modules (2022. Voramar's classroom. TECLA.)



IMAGE 10 & 11. Puig i Gairalt display pyramid made with 3D printed hubs. (2022. Voramar's classroom. TECLA.)

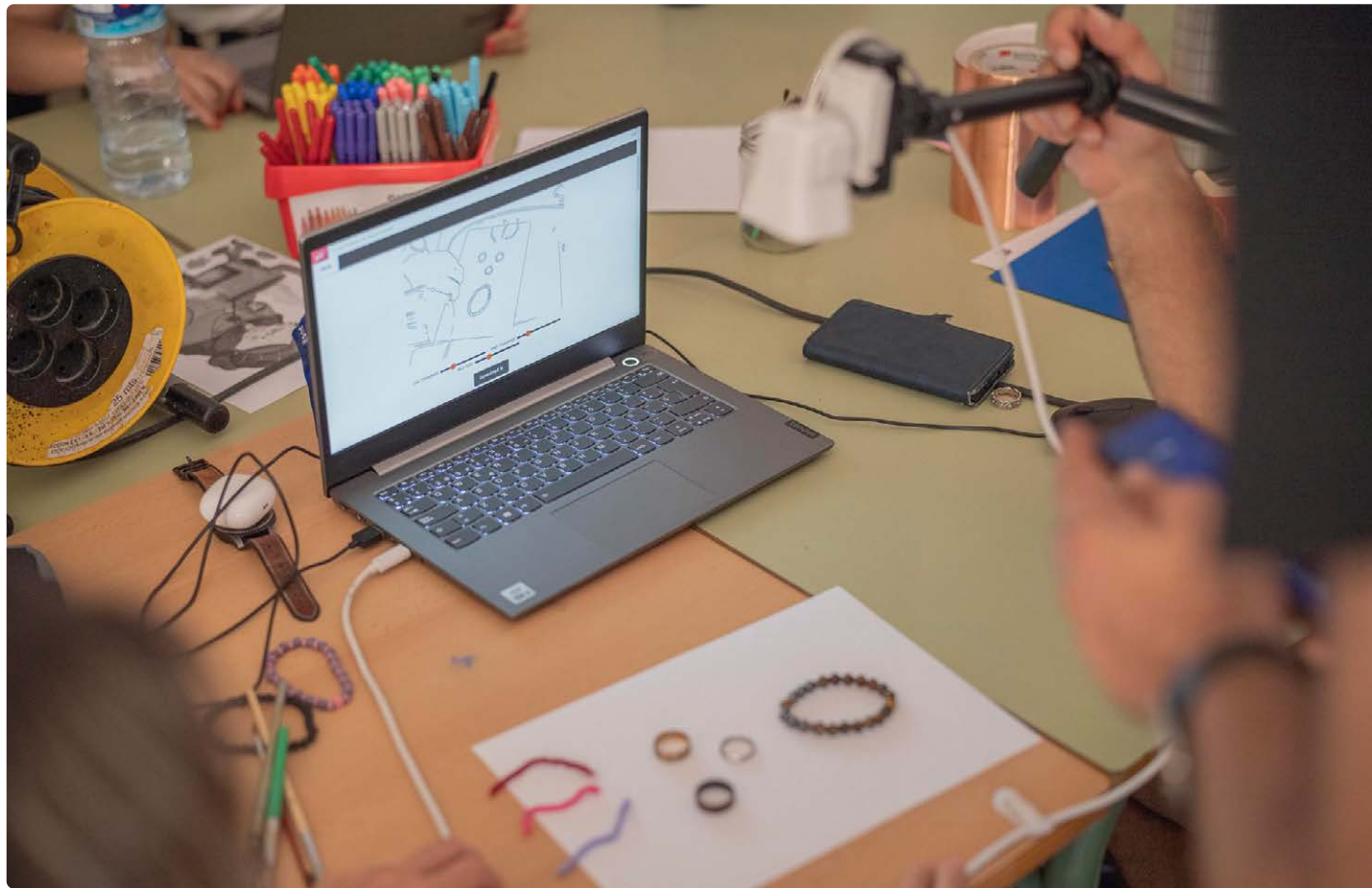
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Institut Escola Puig i Gairalt, L'Hospitalet de Llobregat

Spatially the Puig i Gairalt case might seem to be less ambitious, but it served to test the idea of using 3D printing pieces to generate a spatially relevant totem that could be used for displaying the project results as well as serving as one on its own.

The students had been working on ancient Egypt, so it seemed logical to shape the totem as a pyramid. The thought of using 3D printing as the main technology in the hacking of spaces, due to its affordability and accessibility, had been growing at the time. So the pyramid was designed to be built just by assembling five 3D printed hubs and some wood studs, and covering the faces with cardboard to display their work.

The final structure was displayed in the corridors of the school during the project's development. It served as a demonstration of their learning to themselves and the wider educational community. It was also the main element that articulated the space for the final project's family exhibition, demonstrating the significant potential of using 3D printing to modify spaces.



CONCLUSION

Regarding the question that inspired TECLA's methodology - "Can the physical space itself inspire creativity and be a source of inspiration for maker education?" - the collected indicators are mostly qualitative, based on personal feedback from teachers on the case studies studied so far, and on our experience in a higher education environment. However, it appears that sectorizing the learning space, utilising new tools and materials, and documenting the learning process with a moodboard may positively impact student engagement.

Gaps & Next Steps

Further research is necessary as TECLA's conclusions about the spatial intervention are largely based on observation. A suggestion is to involve children in the design process using a participatory approach to consider their perspectives on how the space should be used. Additionally, a methodology for collecting quantitative data on the subject could be developed, although measuring creativity and curiosity may pose challenges.

The primary objective for the future should be to create a comprehensive framework and toolkit to aid in the process. A guide that can be utilised by all schools, regardless of their socio-economic context, seeking to restructure their classroom spaces to encourage curiosity and creativity. This includes strategies for sectorizing the space and sharing files and materials for custom 3D printing, vinyl cutting, or laser cutting. Possible elements for the digital manufacturing toolkit include pegboards for tool display, mood boards, display structures, or quick release systems to lock desks together for tidiness.

Redesigning the space for teaching practice is not a one-off exercise. It is an ongoing process that involves a lot of trial and error, accompanied by a deep process of reflection on how the space serves us and how it could serve us better. Although it can be a challenging process, it can support learning engagement and lead to more meaningful and enriching experiences for students and teachers alike.

IMAGE 10 & 11. Teachers learning about vinyl cutter and serigraphy (2023. Escola Miguel Hernandez - TECLA.)

Manifesting Chimeras

The mycelial practices of queering design

By Mathilde Lasnier Guilloteau from *Collective Transerrances*

This article introduces a research project on multitude as a paradigm for collaborative design, in the midst of changing design education and practice. A change in paradigm means rejecting a more traditional approach to design in favour of unconventional, transdisciplinary mycelial research – a practice which I draw from fungi's biology of interconnected expansion.

Multitude as a paradigm highlights the queerness of mycelial practices: they are non-normative, unusual, not properly acknowledged, and shine by their oddity. Mycelial practices of design thrive on reaching various directions simultaneously, always facilitating entangled relations instead of separating individuals. Collaborative design can be as patchworky as chimeras are manifestations of weird and frightening assemblages which celebrate queer multitude and complexity.

Queering design contributes to stepping back and perhaps unlearning what has been taught as prioritising solutions over processes. Queering design celebrates unconventional practices of creation and making that belong across different categories. Queering design designs against capital by manifesting chimeras.

CONCLUSION

What do fungi have to do with design? So much. A couple of years back, I realised that fungi are much, much more than mysterious creatures of the wood with the potential to become delicious on my plate. I was researching alternate ways of recycling plastic waste during my thesis¹, and the discoveries I made shifted my focus toward living with plastics and fungi as whole creatures of my daily life. Fungi and plastics have in common to be omnipresent in human life, thus going mostly unnoticed or ignored – yet designers are much more familiar with the latter. Fungi have amazing adaptation abilities, and what caught my attention is their spontaneous and endless biology of expansion – mycelium. Mycelium is the root-like structure that most of a fungus' body, and in the case of mycorrhizal fungi, the mycelium grows

by connecting its neighbouring plants' mycelia go practically unseen, and live on forever, growing as they feed. Planet Earth is covered in mycelia, and we cannot even fathom just about a fraction of their presence.

Fungi are so fascinating. The Western history of mycology is deeply rooted in witchcraft, and for a long time, related research was dismissed as mere women's kitchen work, which probably explains why fungi have only been recognised as their own realm – neither plant nor animal – for less than sixty years. Besides, fungi are amazing queer icons; it is actually hilarious how the human-based semantics used in mycology just cannot keep up with fungi, because they have various means of reproduction, including asexually, and some of them have thousands of different genders, yet they effortlessly endure. Over time, fungi have become a core element of my practice and research as a designer.

As an organism able to grow its world by connecting with others, fungi can simultaneously be a creator, collaborator, facilitator, mediator, and destroyer – an ever-changing web that creates and nurtures its ecosystem². Fungi are the epitome of what I call coliving – living together, different species' lives intertwined, who grow and flourish with each other, on entanglements. Considering this, fungi hold such a peculiar position of power because so many organisms and relations depend on them, all the while they in return depend on the very bridges they grow upon³.

And I would add that designers hold a pretty similar position. Design as a process happens quite organically, especially when interacting with clients or collaborators of any kind – the project grows and expands, and might not be revolutionary, but it is solid because it reaches from the existing elements which ground it.

In my research, fungi act as a powerful catalyst when shifting away from an anthropocentric position, which also changes the role and tools of the designer. Fungi exist beyond human scales of time and space – more than this ubiquity, it is mycelium's inherent networking

that I wish to bring in my design practice for this research, as a process of thinking, making like fungi, slowly, on entanglements and existing relationships. A mycelial practice of design acknowledges its situatedness and the entanglements it is part of. It is not independent of the others that brought it to be in the first place, whether it be materials, creatures, places, stories, or relations. It is fluid, it goes beyond scales and boundaries, and some part of it is and remains mysterious and unpredictable. It is about having fun and striving for social and environmental justice, learning what amount of fuck to give and unapologetically taking time. It is not so much about forging new connections as it is about nurturing existing ones. It also means to articulate the sources and bits of knowledge involved in horizontal ways, paired with a mindful use of tools and materials. Such an exercise of design is quite literally all over the place because its nature is to reach simultaneously in various directions, and makes sense by doing so.

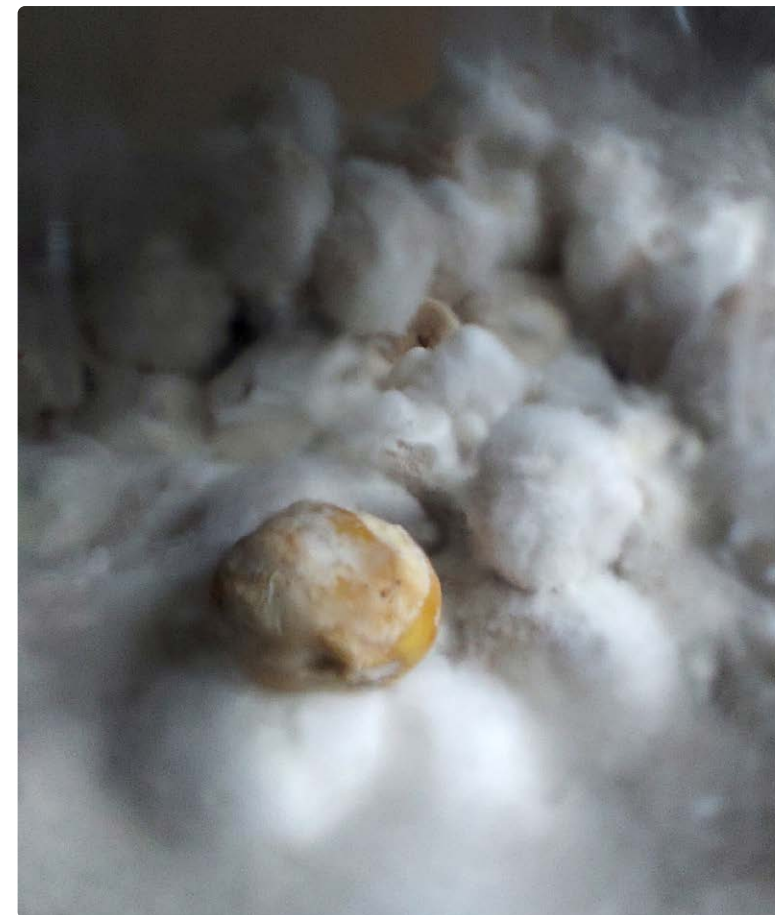


IMAGE 1. Sample of a home-grown culture of the plastic-decomposing fungus *Pestalotiopsis Microspora* (April 2022, Växjö, Sweden, Betül Hafizoğlu)

MYCELIAL SHIFT: DESIGNING AND COLIVING

How can coliving happen in a design project? In many different ways. Design is inherently collective, in that a project cannot be completed in its entirety by a unique person – there will always be at least one stakeholder who is also involved in the equation. Working as a designer is also a form of coliving because it is a matter of working, collaborating, exchanging, and producing with someone else. And when that someone is not human, coliving brings the collaboration to another level. Facilitating a situation of coliving between creatures who ignore each other is possible with the help of specific artefacts designed to bring forth such relations. A plastic-decomposing fungus, for instance, can be brought at the same level as humans through an object meant to establish a direct relation between the two via their own relation to plastic waste.

In my previous work with fungi and plastic waste, the project took a real turn when the three actors merged into a fungi-plastics-humans triad. Anthropo-centring design has since been one of the pillars of my research, and much effort was made at the time to bring the human backstage in order to let the other elements of the triad bask in the centre light as themselves, and not through functionalist goggles. Keep in mind that one of the red threads was to openly integrate the fungus' life in the human one, by adapting the human's so that both would benefit from this speculative relationship. Coliving was a driving force of this project in that sense, because it is within such positionality that a designer finds themselves able to really shift the relation and the previous hierarchy which opposed the different creatures.

Various artefacts were designed during this research over the span of seven months, all the while aiming to develop and materialise a methodology of fungi-centred design through co-creation and speculative scenarios. During the early stages of the project, me and my first collaborator – a fellow design student – designed a coffee table capable of hosting a growing environment favourable to the fungus. This artefact also became a support for direct human-fungus interaction, with the fungus being a noticeable guest to which the human tends by providing a suitable environment and feeding resources. The second stage of the project focussed more on integrating fungi in human activity via a series of props made from scrap materials – more on that later. However, the fungus' needs have not been met as well as the human's, and a more thorough approach could have been to adapt the human activities life to fit the fungus' specific diet.

This project brought to light the odd relationship between plastic-decomposing creatures, plastic waste and humans in daily life, the odd compromises they might have to make, and how deeply the role and importance of design/er change. In such a context, designing objects is by no means the goal – it is only a tool which is part of the journey of designing. And when more-than-human creatures are involved, functionalism loses its appeal, because even humans aren't guaranteed to behave as anticipated.

Shifting the focus toward others as well as getting closer to them frames a practice that seeks to de-centre a discipline that has shifted into reflexes – reflexes which are the ground of norms established supposedly to provide the best to users and humans, but sadly lead to uniformity in the responses proposed to various needs and contexts. Because context is everything, anthropo-de-centric design morphs outdated and ill-adapted rationality into a form of relationality that manifests within queer relations between humans, more-than-humans, materials, and other creatures met along the way.

THE QUEERNESS OF COLLABORATIVE DESIGN

There are many definitions and practices of collaborative design, but I would like to bring up the shifting role of the designer. A collaborative project involves two or more people or groups who work together – a scenario in which dynamics of decision and making befall a facilitator as much as a designer. And this whole thing is so relevant to design and designers because in a context where the project can only become as a collective, when it is obvious, unavoidable, undeniable that not one person – say, the designer – will be the one doing the decision-making, then the power this one person holds will shift, and their role will change accordingly. This is also what 'designing with' means, and as far as collaborative design goes, it is likely that not much of traditional designing will happen. Coming into this as a designer means knowing when and how much to step back, what tools to provide the others, and how to facilitate communication between them as well as outside of the project.

In instances when my collaborators are living and multitude but beyond the grasp of human perception and comprehension, like fungi, I have to adjust my tools, strategies, and means of communication in order to better welcome them into the project – and to explain what I am doing with them, why and how. This involves unlearning some things I have been taught in my design education, straying away from some fundamentals to question what I might have taken for granted, and even radically shifting my positionality and the deeper personal motivations fuelling my involvement in the project.



Collaborative design thrives on the multitude, for it brings together different people, groups, entities, and creatures – all looking for something they have in common, how to reach a compromise, and how to make something together. But this multitude can be untameable, and it might create something unexpected, something new, or something unusual – something queer.

Ok, but what do you mean by queer? Everything. I choose to embrace all the meanings of the word, noun, adjective, verb, positive and negative alike. Queer is a wonderful word, actually. Its significance and weight have changed but the essence of its meaning remains unchanged. A meaning I deeply

IMAGE 2. Fungi-friendly coffee table, premises for the research of Fungi+Plastics = <3 (December 2021, Department of Design, Linnaeus University, Växjö, Sweden, Photo by Betül Hafızoğlu in collaboration with the author)

IMAGE 3. Fika with Fungi: ritualising coffee time with fungi time. (January 2022, Department of Design, Linnaeus University, Växjö, Sweden, Photo by Betül Hafızoğlu in collaboration with the author).

cherish is the unusual, the oddness of something, which bears an intrinsic power of transformation simply by being in contact with the norms of a context to which it doesn't conform. More generally, I use queer as an umbrella word referring to LGBTQIA+ identifying folks, alongside all the correlated cultures, ideas, gestures, and struggles. In my mother tongue, no word translates oddness and non-normative identity as synthetically as queer does, so I use the English word, and there is no room for confusion over its meaning. Self-explanatory and efficient in its queerness.

The queerness of my or my collaborators' identity might not be the focus of our work, but the position I assume as a designer comes with a certain responsibility, which stems from what each of us brings into the project by our involvement in it. Of course, my own research is shaped by who I am, and I will make some choices of my own volition based on my preferences and priorities – what it means is that the basis of my work is always already queer. It is queer because it emerges from queer sensibilities and needs which need to be acknowledged and materialised, especially when they don't meet those assumed by established sociocultural norms of gender, sexuality, and relationships. It is queer because it deviates from what I have learned as rules of homogenisation which reserve the privilege of the most convoluted reflection only to the highest academically ranking individuals, no questions asked. It is queer because I am willing to go down a path that brings my projects further away from the established Western norms of beauty, materials, production, waste, and communication. It is queer because it is about knowing when and how to deviate from standards because one size doesn't always fit all.

WHEN THE MULTITUDE IS QUEER

A mycelial practice of design leads to design projects becoming patchworks because of the nonlinearity they embrace with diversity and plurality being their foundation. The aim with being mycelial isn't to flatten the results and provide a unique solution, but rather to explore and embrace the multitude which comes from within. Multitude etymologically refers to an abundance and strength, and although the current meaning might deviate from the latter, multitude is in some instances synonymous with an uncontrollable force – think of a crowd.

So, how does all this manifest in design? Let me begin with how the queerness came into my research. A systemic approach to design requires bringing the different stakeholders all together with their influence's range, which contributes to prove how intertwined they are. As a designer, I work on existing connections by identifying them, bringing them forth

and making space to ease their becoming – a mycelial practice of situated design.

Multitude as a paradigm means that multiplicity can happen at any point of the project, which leads to the project morphing into assemblages, for they can only be a group of things. A deeper change in the paradigm of the design process manifests through said assemblages because they make room to shift positions between the collaborators and all the parties involved – as much as possible – and by doing so facilitate entangled relations instead of separating individuals. There can be change here precisely because of the inherent multitude of collaborative design processes. When design education and history prioritise individual projects and success over collective ones, striving to design assemblages is a radical shift away from this dominant narrative.

Designing with a multitude means embracing complexity to better craft shared futures. Collaborative design should always care to multiply the voices it carries, as one entity with multiple identities to it. Because it is a collective process above all, where the end product doesn't matter that much, hierarchies can more comfortably be flattened between the different parties – between who has more experience, more skills, more resources, or more time. This could result in the project being a queer reading of the situation, where one lives a partially imaginary, decidedly multispecies life, and acts on it. But what matters most is how the concerned parties manage to exist within the current situation they find themselves in. Equity⁴ is a powerful strategy in doing so, because it is a stepping stone toward equality, and can facilitate relations where creatures who have different needs can become together and flourish.

Accepting and caring for the oddness makes for mycelial relations which reinforce non-normative relations as kinship – like when I consider a plastic-decomposing creature my equal, which means I will do my best to provide them as I would provide a guest with food and comfort. It is about talking and writing as much as about making and caring. What matters is to consider the consequences before the action even begins adequately, or to rebalance an unequal situation according to the existing context – a direction also followed by waste-led design.

As a designer, I have to be more acutely aware of my odd collaborators and sync up my relations with the creatures I meet along the way. The odd is not odd, for it is already deeply embedded in the human body, especially when we share an ever-changing and damaged ecosystem. The queer, the creature, the odd one is often considered other and antagonised when they have always already been there. Fungi, plastics, and humans are deeply intertwined, not just in their present, but also in their upbringing, and their becoming together. The odd brings up entanglements

that are based on relationships that are not always visible, and deeply queer in their positioning of humans at the same level as other creatures. The odd grows on trans-scale and multispecies connections between unexpected kin⁵, which in turn morph into multiple forms of radical care, opening the way for queer systems and sustainment, which manifest within queer ecologies.

DIVING INTO QUEER ECOLOGIES

What are queer ecologies? A theoretical, practical, creative, and scientific framework that brings together ecologies and queer theory. Queer ecologies reject traditional frames of human exceptionalism, anthropocentrism, and norms related to gender, sexuality, relationships, and reproduction, in favour of interconnectivity, togetherness, and multispecies becoming. Queer ecologies flatten the hierarchies between human and animal, nature and culture since the relations between and within each pair are ambiguous, reciprocal, and cannot be severed. Queer ecologies bring the unwanted ones into the spotlight and expose their potential for co-becoming⁶. Such positionality provide a solid background for biology research intersecting with feminist and anthropology works⁷.

The permeability of humans to their natural environment is a core element to understanding queer ecologies, for it also lays on embracing a non-linear hierarchy between the creatures coliving in a shared setting. There are many approaches to queer ecologies, one I have explored is related to plastic pollution, which is a strong marker of human activity in the Anthropocene⁸. The production, use, and disposal of plastics lead to an increase in toxic pollution, and toxicity, however global, is unequal. Despite numerous efforts, the never-ending loop of hierarchized and linear waste distribution is a strong cycle, since it is deeply rooted in the dominant capital-driven paradigm ruling our global systems which nurture and feed from violence and inequalities. While toxic exposure is undoubtedly a manifestation of slow violence and waste colonialism⁹, what stands out is also the increasing proof of the omnipresence of plastics in and outside of human bodies. Since this type of pollution can affect anyone, queer ecologies bring in a different frame to navigate the situation, namely by focusing on the queering of human bodies (with or without health consequences), as well as the queering of fauna, with the increasing number of novel entities.

Human activity changed nature so much that it resulted in plastic-decomposing creatures evolving within the plastisphere, the great garbage patch drifting across our oceans. Those creatures are mealworms, bacteria, fungi – and humans contributed to their accelerated

evolution. Within such a perspective, when it is not devastatingly damaging, toxicity can be considered generative, and this paradigm of toxicity-as-method¹⁰ can be a great catalyst in decolonising plastic waste and contributing to a regenerative future.

Generative toxicity can materialise the frictions and speculation which condensate in queer relations. The frame of queer ecologies prompts me to queer my own design principles and references, which also involves shifting toward multispecies practices to anthropo-de-centre design and deeply rethinking sustainability. A mycelial practice of design orientates systemic design toward a more relational practice. Considering toxicity as generative represents such a deep shift in the ecological paradigm because it shows that human actions involuntarily modify human boundaries, and even nurture odd hybrids between artificial and natural processes. A change in those boundaries can result in very unique and intimate changes – changes that are not commonly addressed when discussing matters of climate change and ecological emergency.

This positionality allows us to dive into a more intimate dimension of sustainability, when queering also happens as design contributes to de-centre humans in their relations to each other, to other creatures, and to the world. As a designer, before even diving into the project, this also involves reconsidering how much I can actually (anthropo-)de-centre myself, and how willing I am to give up the boundaries of human exceptionalism and domination. All this unravels at various levels, which is also a reason why matters of context are also matters of scale – scale for being, actions, and becoming. By shifting to the toxicity-as-method paradigm, for instance, I focus on the generative and queering dimensions of toxicity, in a proactive way, which allows me to tackle it at a personal scale – say, my daily life.

THE INTIMACIES OF SUSTAINABILITY

Sustainability might have become a cursed word, more often synonymous of corporate greenwashing and carbon offsetting, yet it remains quite strong in its meaning, if only for lack of a better, more appropriate word. As much as sustainability is overused for all things nature and climate-related, it stays strictly within the domain of what is public and can be generalised. The sustainability of a household for instance is most of the time only addressed through what can be quantified and marketed – domestic waste sorting, organic products, reusable containers, etc. However, standing with queer ecologies means diving deeper into the intimacies of sustainability: when bodies change, relationships change. A human



carrier of microplastics in their body can become a host to a plastic-decomposing creature – queered bodies lead to queering relations. Designing within queer ecologies means reconsidering hosting and caring through the prism of multispecies practices¹¹, which urges to step back from the front of the scene to deploy togetherness – and by doing so make space for fungi and for other creatures.

From personal to infrastructural, relations of care happen at multiple scales, all the while the current status quo barely allows queer relations while at the same time creating them through the existence of established norms. To unapologetically embrace multispecies and non-normative practices of care might be considered disobedient, disruptive even, considering the context where such relations happen. Yet this positionality aims to make space for ambiguous forms of care, sometimes involuntary, sometimes uneven, sometimes unidentified, but

IMAGE 2. Prototyping coliving devices during the Radical Speculation Lab workshop, part of the project Fungi+Plastics = <3 (May 2022, Department of Design, Linnaeus University, Växjö, Sweden, Image by the author)

always already there. Care-taking, caring, taking care, giving care, those come carrying matters of responsibility – and this responsibility is embodied by a close loop of queer relations.

Designing in this context also means designing the context by exploring the boundaries and intimacies of sustainability through relations of hosting and interfaces for coliving. Which relations can sustain themselves, how they happen, which gestures facilitate them, and have the ability to morph forced entanglement into relations of care. In the case of coliving with plastics and fungi, designing is a fluid research process that aims to materialise and facilitate decolonising gestures in everyday life situations. Caring for your waste instead of feeding the cycle of displacement is possible when a relation of care is developed and adapted to daily life – imagine how you would compromise to integrate a plastic-decomposing creature while carrying on with your usual chores.

Collaborative design can be a strong tool in contexts of intimacies, because the whole process of project-creation-use has immediate consequences, and should therefore be aware of its own systemic role; and because a collective approach to personal and private matters can reveal more connections than isolation. Designing in queer ecologies also

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means that any systemic approach to design is above all relational, because it also reflects on non-anthropocentric queered understandings – of coliving, of materials, and of collaboration. There is so much potential for coliving once the pre-established boundaries have been given up, or even willing to be lifted. Hosting for instance becomes a way of being which goes beyond mere surviving and strives to develop its own diverse and meaningful way of living; not just enduring, but adapting and choosing. I choose to care, and this leads me to design interfaces for coliving, with collective tools which can be activated by relations of caring and hosting.

QUEERING DESIGN: CHIMERAS AGAINST CAPITAL

When forced entanglements become relations of care between creatures, people, entities, mycelial practices of design can facilitate how such relations could be embodied, what compromises are made and by whom, and how they can manifest – odd, patchworky chimeras which function and sustain themselves by being an unusual puzzle. Embracing collaborative design as unapologetic yet very real chimeras means queering design.

Why chimeras? Chimeras are creatures of fabulation, assemblages composed of mismatched bits and parts. Their alleged weirdness deems them frightening in Western mythology, as monsters whose names are given to gargoyles, genetic oddities and unattainable fantasies – and much could be said of the symbolism behind the male hero hunting and killing a creature symbolic of the destructive forces of nature. And it just so happens that mycelial, collaborative practices of design are by their very nature just as patchworky, more often than not overlooked for favouring the multitude over the individual, yet nurturing ideals of fruitful coliving.

Collaborative design – which I deliberately use quite loosely, for any exercise of design is collective to some extent – brings together designers and non-designers, humans and non-humans, who live and share and shape the same environment. Materialising

entanglements of collaborative design by bringing forth their collective practices and multiple identities makes way for patchworks and assemblages as results of such effort. No solution or one-size-fits-all product, because there is no such thing as a universal answer. There might be some common denominators, like a need for accessibility or a desire for comfort, but the multitude within remains as what it is – multiple and complex.

As traditional education and practices of design increasingly fail in regard to the increasing climate and social emergencies, fungi can teach us about connectivity, and interspecies, symbiotic relations, which prompt design to shift away from an anthropocentric, capital-driven position. In relation to hosting, considering that the giver and the receiver of the hospitality can be one and the same being, if I give and take from fungi, they can give and take from me too. And because our interactions blur the boundaries between us, they can happen anytime, anywhere, at any scale. The same could be said of any creature I

am coliving with, especially when I don't know them. The designer's role evolves in accordance with this, and slowly, steadily, I find myself wanting to make even more space for fungi, and for other creatures, so that we can better listen to them – and to each other. And by listening to them for who they are, not to utilise them but to learn from them, the relevance of non-normative relations, identities, and practices come only brighter into light.

When I refer to queering as a process – queering design, queering ecologies, queering anything – it reflects this position of straying away from capital-driven practices of design built off Western socio-cultural hegemony and politics of creation, making, distribution, use and discard, which are deeply intertwined with a corresponding heteropatriarchy, feeding each other's norms. Deviating from such frames as a designer means assuming a certain position, which can be manifested in design processes, products, different uses of languages, graphics, etc. The collective Bye Bye Binary materialises and actively contributes to the queering of gendered languages like French through graphic design and typography, in order to shift the language beyond the binary inherent to the strict gender dichotomy it is frozen in¹². Their Queer Unicode Initiative (QUNI) gathers lovingly designed fonts, most of which are available online as Open Font Licence – efficient, quirky, elegant visual tools which openly manifest their queer intentions. I use those fonts as much as possible in my own work, especially when I write in French.

Since I started my research on fungi and plastics, I have developed my own tools and strategies for ambiguous design and unconventional practices. Assemblages, as I mentioned earlier, are a way of making a design project so that flattens the hierarchies of relations, and by doing so facilitates collective world-crafting. For an assemblage to expand and gain in solidity, any means can be used to visualise and materialise it, although I would tend to go with maps. I use mapping as a mycelial technique that is flexible and easily manipulable to introduce others into the project, which makes it a simple but efficient interface for world-making.

I found that laying down all my ideas and visually connecting them can do wonders to highlight the queer relations and odd creatures which come together, especially in a collaborative project. Mapping is also a mode of storytelling and communication, as it brings together many different stories by its materialisation, which can potentially change in any way possible just by a single word, line, colour, or doodle. Besides, maps are a great support to engage participants or an audience of a collaborative project, because it is simple yet very flexible visual communication that can articulate the different



IMAGE 5. Example of three 'QUNified' fonts from the same text. Fonts on the left side use the median dot, currently the most common way to write inclusively in French. Fonts on the right side have been 'QUNified', with special glyphs used instead of the dots. (2021, Image by Bye Bye Binary)

IMAGE 6. Brainstorming the premises of Collective Transerrances (September 2023, Paris, France, Photo by Loan Grac in collaboration with the author)



IMAGE 7. Ideation and materialisation of a scenario for hosting plastic-decomposing fungi with scrap materials during the Radical Speculation Lab workshop, part of the project Fungi+Plastics = <3 (May 2022, Department of Design, Linnaeus University, Växjö, Sweden, Image by the author)

parties beyond their own scales, therefore opening a dialogue and a space for reconsidering them in their togetherness.

The designer becomes an agent facilitating interactions and ambiguous forms of care, and does so by blurring the boundaries between the creatures, as they focus on rebalancing their shared system. This can be done by physically bringing together the different actors of the project, for instance during a workshop where ideation and materialisation of such interactions can manifest according to each creature's need. Depending on the context, this might generate some f(r)ictions with reality by changing some things and leaving others to be. I consider this a form of close fiction because of its proximity, which is actually quite permissive since it brings a speculative dimension in the project. Queering design does not necessarily equate speculation, but it always pushes to challenge the parameters from the existing situation, for instance by letting in the involved creatures for who or what they are. Queering design also involves queering the commonly used references to which effectiveness, comfort, or the usual criteria are traditionally measured.

Besides reaching for multitude and complexity, a mycelial practice of design strongly revolves around its own situatedness – where the project is located, who and what is involved, what reach they have – which means going back and forth between scales. This approach pertains to metadesign¹³, as the process looks into the causality linking the different levels of production, consumption and action together. Considering the plastic waste I produce for instance, I am more aware of where they come from, and where they might end up. What I am looking at is not just an object any more, it is a condensation of labour and energy, of matter from living and non-living beings, all places it bears an invisible trace of, compacted together into something that might be deemed valueless anytime, before being discarded.

A mycelial, queer practice of design is one which knowingly, and maybe not by choice, designs with scraps from overconsumption and capitalism in a multi-connected world. When the emergency to slow down is stronger than ever, I aim for a waste-led practice which focuses on the process and does not force for solutions, especially when my collaborators are not humans, in order to bring what we have together in one place and assemble it into something that functions within our own set of values and methods.

As a young designer constantly refining my own practice, I refuse to contribute to even more plastics production, nor do I want to create waste as a by-product of my work. I refuse to perpetuate capitalistic, cis-heteronormative, colonial norms of what comfort, effectiveness, or beauty should be. I don't think there

is a right or wrong way to design against capital, but I do believe that materialising a collective front against blind functionalism and an elitist dominating design education pliant to the market is a step that has already taken off without really knowing where it will land.

As I grow with my design experience, I seek to develop some principles for queering design and straying away from individualistic, patriarchal, capitalistic norms:

- Unlearn and decompose what has been taught as generalisation;
- Seek out unconventional practices and embrace transdisciplinarity;
- Design with changing creatures, ambiguous relationships and fluid interactions;
- Design with planetary invisibility, with toxics as generative, with odd kins who challenge dominating narratives;
- Move toward collaborative ecologies and interdependent futures.

Manifesting chimeras means that we dare to embrace unconventional techniques, call to unusual references, and reject design norms – we know them, and we deliberately choose something else.

I Grew Tired of Radical Education

By Engy Mohsen in conversation with Mohamed Abdelkarim, Huda Zikry, Batool El Hennawy and Hussein El-Hajj

Whenever I am put in a situation where I have to introduce myself or work, I would always start the conversation by saying “I was originally trained as an architect”. For some reason, I felt that this would shield me from harsh criticism, or rather my insecurity for not having received a formal art education.

This text will probably be too personal (and maybe even a bit too political) for my liking.

Later on, that intro was sharpened to “*Although I haven’t had any formal education in art, ...*”. By then, I had also gained another protective layer of shielding; the language, the art speak, the performative gestures. Architecture school has prepared me for the art world better than any art school would. You work under pressure. You learn discipline. You work well with others. You present your work. You sell your ideas. You present yourself. So all I needed was minor recalibration to channel all those accumulated and acquired skills and employ them in an art practice.

I was invited to join the inaugural Roznama Studio Program¹ alongside ten other artists with very diverse practices, which paved the way for my introduction to ‘The World of Art Education’. But even how that program came to be was yet another grand performative gesture.

10 October 2017
Medrar for Contemporary Art
Cairo

A joint statement was released by the jurors² of the extremely popular Roznama - a competition for contemporary emerging Egyptian artists. This was to declare the cancellation of the competition while commenting on the maturity of the proposed works, or rather its lack of;

“We accept the responsibility that there is a strong need for awareness and (de)learning on how to properly approach applications. At this moment, we would like to encourage institutions and individual practitioners within this context to think about

other ways forward, perhaps by considering and initiating alternative strategies and programming in their realms, that reflect a continued commitment to the long-term development of the local art community and art education for new generations of visual artists.”

And just like that, a looming crisis was created.

But the Cairo-based Downtown Contemporary Arts Festival soon responded by inviting Medrar to structure a six-month arts program to support Egyptian artists and facilitate a space for artistic production within our shared local contexts.

30 June 2018, 12:00 PM
Roznama Studio Program
Downtown, Cairo

Engy Mohsen⁵: In retrospect, how do you feel about the tension created while reading an English text that we would later discuss using very specialized Arabic terms? Was the determination to use Arabic motivated by a political position or a hope for promoting the language in artistic contexts?

Mohamed Abdelkarim⁶: We initially decided to design a program in Arabic for many reasons. First, it felt rational because within reading groups or even in casual meetups with other artists and friends, we would hold a conversation in Arabic even after reading an English text. Was it political? No, I don’t see it as such because at the end of the day I’m not switching my language, Arabic is already what I speak. So this was neither to promote the Arabic language nor to make a political statement. It was easier and much more comfortable for everyone involved to use Arabic. We made the decision, however, to take the language all the way.

EM. So was this a conscious decision? At some point you sat down together and openly expressed this intent.

MA. Yes. We weren’t keen on formulating an implicit understanding of a term that we can otherwise translate. So yes, it was a decision. I thought Arabic would be a more practical choice that suits all participants regardless of their educational backgrounds and language of study. But what was revealed to me is that it isn’t an achievement to use a term like Manhajiyat in an educational context, when you will still need to introduce them to what “Methodologies” is. The Arabic counterpart doesn’t mean much to them, it isn’t used often, a dead word. So there is no reason to use Arabic as long as we don’t have a political intention to promote its use and enrich the language. The same goes for some many terms, ‘Pedagogy’ for example, or ‘Aesthetics’.

Now when I reflect on how the program unfolded, I discovered that the effort you need to introduce unfamiliar Arabic terms to the participants, is exactly the same that you would with an English term. At least with the English term, they will be able to engage with it when they come across it in a text.

EM. Why do you think there was little-to-no reference to works or theory that was being locally produced or at least originating from the region?

MA. I don’t believe it mattered because anyways most material would be in English. Even if we decided to engage with works by artists from the region; a performance by Walid Raad will be in English, works by Lawrence Abu Hamdan will also be in English, or Akram Zaatari, and so on. The only reason we would have looked into these works would be identity politics, which wasn’t one of the objectives of the program. So there was this thinking that contemporary is part of a global system, economically, and even how the processes of knowledge production are never particular, and always trying to escape these particularities. As long as we are working and producing within the sphere of contemporary art, we can’t be isolated from all other global factors. This is all to say that what dictated our choices was neither the language nor the nationality of a said artist, but rather the subject or topic of interest.

End Meeting for All

During that same period, I heard of a similar long-term research-based educational program which was entirely artist-run and mostly by its previous students; the Students’ Council Program by StudioKhana.

“An Egyptian art collective, with a focus on alternative art education and providing various archival and educational material for young Arabic speakers.”⁷

Besides being almost entirely self-organized, I believe I was fascinated by the running piece of information within our circles about how some of the organizers went to the extreme length of translating and providing all theoretical material in Arabic. I was wondering if this provided a shortcut or any sort of situatedness.

Seeking answers, I sent out another meeting link.

9 February 2022, 11:00 AM
Meeting with Huda Zikry
Zoom

Engy Mohsen: You have been on both ends of the equation, filling the shoes of the student first and then the organizer.

Huda Zikry⁸: I believe that there is a sense of grounding vulnerability in having been both and continuing to be both. To work and keep being informed by both positions, the necessity of fulfilling a certain role that one wasn’t initially (formally) trained to do creates room for continued learning and acquiring knowledge through practice.

EM. Most participants are graduates or students of the Fine Arts School, meaning that their study language is Arabic. Was familiarization the main reason behind your translations, to remove the potential language barrier and focus on the subject?

HZ. I think I simply tried to think of myself when I was in that position. I would have truly appreciated it if the material that I had to read in English would have been accessible in Arabic.

EM. But I believe this knowledge is also accumulative. So the first time you would translate ‘Appropriation’ would be a hassle, but it shouldn’t be the second time.

HZ. But I meant a step before translation. I am thinking more of those who have no framework to know what to read, what the canon is, what is foundational, what is subversive, or what is

widely known to the point of redundancy. There is a point for everyone where they just don't have the map through which they can navigate what they need to read. That is, if they don't develop an understanding of art education that completely dismisses the necessity to read or engage with texts altogether.

EM. In your opinion, did the act of translation help make the knowledge shared and discussed more accessible and/or relatable to the readers?

HZ. It is hard to say. I believe we can criticize theory and language. We can criticize English, or we can accept it, but engaging with theory needs a different skill set. I believe it is better to sit with a text, understand it and then voice why that does or doesn't suit me if it's unnecessarily long or unnecessarily complicated. I was told by some participants that reading—not a specific text, but reading altogether—isn't beneficial for them because their pursuits were visual.

There is a general problem with reading in the context of art education, reading theory in particular, and reading translated theory which can be extremely challenging. But I feel that group readings offer a parallel practice to translation that grounds and contextualizes the texts while creating a space to offer insight into the processes of reception, selection and translation.

To go back to your question on accessibility, I would say yes and no. If I don't speak any English it is definitely more accessible to read a "difficult" text in Arabic than in a language I don't even know, but I believe we also need to think of why the text is difficult. The reasons would vary between translations that lose some of their meaning to stay faithful to the original text, or a shortage in Arabic terminology. Or maybe the source text itself is unavoidably inaccessible, then you would have to think about how to approach an already difficult text and how to navigate this difficulty, without flattening it through simplification or mistranslation.

End Meeting for All

I kept wondering back to one point. Having difficulties engaging with an English text is fine. One can always hide behind the fact that it is their second language, a foreign tongue. But the same couldn't be said about Arabic. It feels like a different layer of frustration when one fails to read in their language. You can read a sentence very well and understand every word, but as a whole, it renders it meaningless. This reminded me of how Art Speak sometimes just fails to register.

On the note of locality and self-organization, I remember coming across the Cairo Working Group⁹ in 2017 when they organized a series of workshops entitled "Local Stories of Arts & Learning". I have previously worked with one of their members, Hussein El-Hajj, on translations for my two recent publications. The most recent of which was translated collaboratively alongside two of his students in The Translation Lab at Cairo Institute of Liberal Arts and Sciences (CILAS). Yet another interesting model to reflect on.

Seeking even more answers, I set out to talk to Hussein El-Hajj who extended the invitation to Batool El Hennawy with whom he organized CILAS Alex.

9 February 2022, 1:00 PM
Meeting with Hussein El-Hajj & Batool El Hennawy
Zoom

Engy Mohsen: The two of you coordinated courses with CILAS besides taking part in other educational initiatives. I want to ask you, how can we critically revisit the self-organized structures that we create and contribute to as they evolve?

Batool El Hennawy [10]: I believe that education doesn't stop at how it is described, it is a practice. Of course it is informed by what we call it because language is important, but there is always a space for rethinking. It is a rich process that resembles the essence of theorization; you enter this theoretical space in search of something, there is analysis and assessment. The process of revisiting happens in a more organic way, similar to the nature of self-organization. Sometimes it isn't even constructive, but rather deconstructive; to detangle problems and deal with each accordingly.

EM. While navigating these different models and their ever-changing formats, what did you learn about the process of creation and shaping an experience of art education and how 'radical' do you think they were?

We were very attentive to the way we work with participants, and how to communicate certain failures, so that any frustration turns into positioning. There are sometimes these power structures that are built on dismissal and seclusion where information is cut out. "What's happened happened". And if participants were to express their dissatisfaction, they wouldn't generate feedback because of how these structures think of themselves as 'radical'. With CILAS Alex, it was satisfying to see how we were met with forgiveness and understanding when faced with challenges and dead ends, and not in a sentimental way. This is always based on the social contract that you propose at the beginning of a program, and how porous, permeable, flexible, and resilient the program is. And all of these merits are a lot more important than just being 'radical'.

Hussein El-Hajj [11]: I agree with Batool that 'radical' usually makes promises that aren't kept. Most people don't fully grasp what 'radical' means, they just know that it is positively different.

BH: We never thought of styling the program as 'independent' or 'alternative'. We rather focused on designing a program that departs—on content-level—from the challenge of contextualizing knowledge and how to respond to certain urges. We try to understand the subject first, then the context, and finally we try to understand the relationship between both and our relationship to the question of exhibiting—in an analytical way, without necessarily being outcome-driven.

HH: We had to think of how participants can have a space to relate what they are learning to their contexts. CILAS followed a discussion-based learning method and so it was only natural that the conversation would be taken further than what we intended. They needed that to find their own understanding and articulation.

EM. Was there at any point a conjunction between the Translation Lab at CILAS and translated theoretical material for the other courses, to make the material shared and discussed a bit more locally-rooted and/or relatable to the readers?

HH: There was always this assumption that the translated material would be directly related to the courses taught at CILAS, but this didn't happen. The material was related to philosophy of other similar art education models, the experiments and mechanisms of such. Participants would learn about translation through practice, they chose what to work on, and then collectively discuss outcomes.

End Meeting for All

I thought that by having these conversations, I would come closer to any answers. After all, these are all people that I shared personal learning experiences with. We have all stood on opposite ends of the learning spectrum at different times. But I felt that with every question asked, they would always ask me to take a step back first, revealing a context that I seemingly missed. That left me even more tired than I was at the beginning. I am tired because I have failed to come closer to understanding the paradoxical relationship between language and knowledge, and how one can lead to the creation and shaping of the other. Can thinking grounded in this duality allow us to understand what is actually at stake with the choices we make as students and educators?

I will ask no more questions, fearing that I will have to take another step back first.

Authors' note:

This text was originally commissioned as part of the New Art Exchange's project *Our Teaching Takes Shape As We Go* (2021), an initiative about critical artistic education co-produced by Soukaina Aboulaoula and Cindy Sissokho. The project culminated in a book that was supposed to be published by Archive Books (2022, cancelled). An Arabic translation by Hussein El-Hajj was published in *Machi Mashy: Or, in Other Words "Not Working"*, a self-published book edited by Engy Mohsen and Soukaina Joual (2022). Another version of the text is currently being edited by Santiago Pinyol and María Angélica Madero (The Garage School), while using a method that they call under-translation, which will be published on School of Commons' online platform *ISSUES* (2024), and *Towards New Schools* (2024), a publication by Editorial Board for Intercurricular Programmes at the Gerrit Rietveld Academie.

Acción Veredas | Paths-Action

Integrating craftpersonship heritage and maker culture through a learning experience in Higher Education in Design

Project team

Arianna M^a Fanio González;
Carlos Jiménez Martínez;
Jorge de la Torre Cantero

Organization

Universidad de La Laguna

Location

San Cristóbal de La Laguna,
Canary Islands, Spain -
Europe

Project type

Learning experience
through product

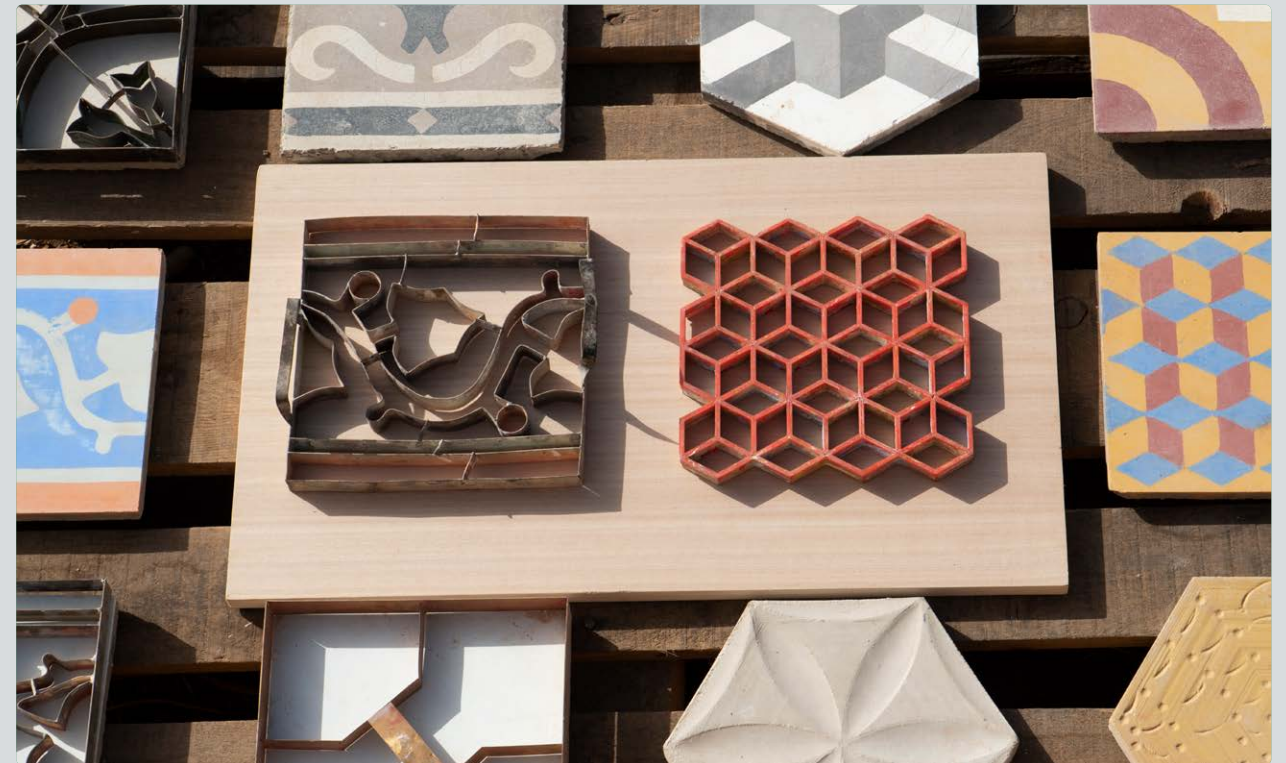
PROJECT DESCRIPTION

Acción Veredas (Paths-Action) focuses on the revaluation of the semi-industrial craft of hydraulic tiles through a maker culture approach. This heritage is present in numerous buildings from the beginning of the 20th century and the craftpersonship is currently extinct in the Canary Islands. In this region, a social organisation is rescuing the knowledge of hydraulic tiles by combining it with a Fab Lab approach, which led our research group to start a collaboration to introduce it into the classroom.

We established an initial workshop based on the maker principles, Understood as the premises of democratisation of knowledge and digital design and fabrication technologies [1,2,3,4,5,6], and carried out for university Design students. Participants are guided to take on the role of makers of new tiles, engaging in a collaborative project that ranges from design conception to the physical creation of a hydraulic tile carpet. A hybrid construction technique is used to produce the tiles in a non-traditional environment, combining traditional knowledge with tools designed and manufactured using digital fabrication technologies. The workshop is also characterised by the integration of playful dynamics that encourage participation, engagement and collective dialogue, as well as project documentation and the creation of resources under Creative Commons licences. Throughout the process, the classroom is also connected to the territory through local institutions and the situated urban heritage. As a result, students become aware of the heritage, acquire collaborative, open design and Fab Lab skills and contribute to the decentralised documentation and dissemination of content about this craft.

CONTEXT AND HISTORY

Acción Veredas is part of an ongoing doctoral thesis, at the beginning of which, a mapping of the maker labs in the Canary Islands was carried out, with a particular focus on those that have emerged from entities with a social base. Among the cases identified is the NGO Aldeas Infantiles SOS, which develops a wide range of socio-environmental projects. In 2013, this organisation began a traditional



hydraulic tile workshop with the aim of transmitting this craft and making it accessible to new generations. Although the craft of making these pieces has disappeared from the Canary Islands, it constitutes a living cultural heritage that can be found in many with buildings from the early 20th century. Over the years, this workshop has experimented with the creation of new moulds using digital design and manufacturing technologies, an aspect that caught our attention during our research [7].

In 2021, as part of the thesis, there was the opportunity to learn the process of making tiles in collaboration with Aldeas Infantiles SOS. This experience, combined with the declining heritage value of the tiles and the possibility of addressing it in the classroom through maker culture, marked the beginning of the Acción Veredas project.

WHAT IS THE NEED IT TACKLES?

The project aims to highlight the artistic, historical and artisanal value of the declining heritage of hydraulic tiles in the Canary Islands, exploring its past narrative and proposing future perspectives. Through the workshop design, there is an opportunity to promote student-centred learning in university classrooms, connecting students to the real world and providing spaces for reflection, experimentation and action linked to the territory. In this context, a local reality is presented, characterised by the disappearance of the craft, the prominent presence of this type of pavement in urban areas, the lack of documentation on the subject and the absence of local actors working on it.

The workshop allows to promote co-responsibility with this heritage through a process that establishes links between the participant and the object; to promote 'doing it together' over 'doing it yourself', with an educational approach inspired by maker culture; and to offer the acquisition of manual, digital and social skills. It also explores, through its transformation into a neocraft, the generation of open digital resources for decentralised replicability, documentation and the creation

IMAGE 1. Samples of hydraulic tiles and frames belonging to the NGO SOS Children's Villages (2021, SOS Children's Villages in Tenerife, Arianna Fanio, CC BY-NC-SA)

of reciprocal workflows with related communities. In short, it combines heritage conservation with educational community participation and the promotion of new forms of creation.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

The aim of the workshop was to provide access to both the design and manufacture of hydraulic tiles, meeting two main technical requirements: a construction system that would allow tiles to be made in a space without the traditional tools of the craft, and a method of making moulds that would be easy to replicate and produce. To achieve this, we embarked on a process of ethnographic research and specific bibliographic review, which culminated in the combination of traditional knowledge and innovations developed by the NGO Aldeas Infantiles SOS in Tenerife, with instrumental contributions of the Anda project by Estudio Valija in Argentina [8]. This synergy of knowledge was transferred to the Fab Lab ULL, where we carried out experiments and evaluations to verify its viability. During this phase, we built tools both manually and digitally, created video tutorials for the creation of three-dimensional moulds, and produced tiles of sufficient quality for the educational purposes they would serve in the classroom [9]. In the experimental process, we also introduced our own contributions in terms of spatial dimensions and workflows in order to enhance the practical dynamics in the classroom, as well as the collective management of space and resources.



Subsequently, the learning experience was put into practice with a group of university students (n=17) from the 3rd and 4th years of the Design Degree at the University of La Laguna, in the subject of Ecodesign, during the academic year 2021/22.

IMAGE 2. Collaboration between colleagues during the creation of a tile (2021, Faculty of Fine Arts of the University of La Laguna, Arianna Fanio, CC BY-NC-SA)

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

The first workshop has made it possible to gather feedback from participants, evaluate the content and dynamics of the workshop, establish local links and begin to explore the heritage of hydraulic tiles in the Canary Islands. The learning methodology used facilitated the design and production of tiles without the need for traditional tools in a conventional classroom setting. According to pre- and post-workshop surveys, participants improved their technical and social skills and discovered new local stakeholders. Resources were also created in both digital and physical forms conceiving: eight tile designs (two-dimensional files and three-dimensional models for 3D printing), video tutorials, a visual collection of local tile examples on Pinterest [10], an explanatory audiovisual about the workshop for dissemination purposes [11], 3D printing tools and the hydraulic tiles themselves.

As a further result, the project was selected for the 'Jóvenes Talentos del Diseño Iberoamericano' exhibition in 2023 [12].

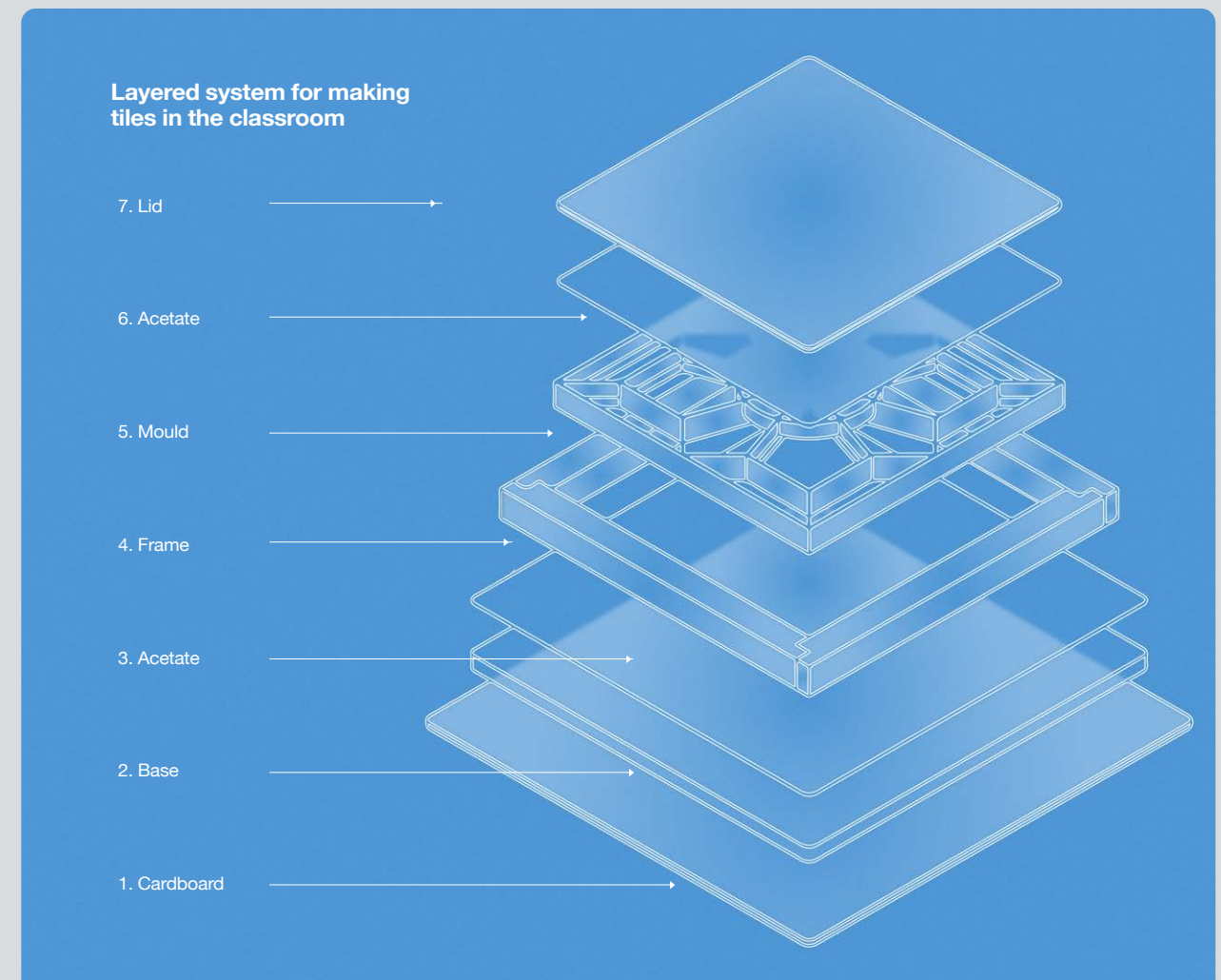


IMAGE 3. Layered system for making tiles in the classroom (2021, Fab Lab ULL, Jorge de la Torre, CC BY-NC-SA)

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

The project focuses on contemporary issues, emphasising innovation in craftsmanship and the revitalisation of traditional techniques in a digitalised environment. Focusing on a widespread heritage, but with a particular emphasis on the Canary Islands, it aims to promote collaboration between local actors and learning, while developing digital resources for decentralised reproduction and dissemination. In this way, the initiative hopes to act as a bridge between the local and the global, creating significant experiences in the territory that generate resources accessible worldwide. This will allow people from different regions who are aware of the disappearance of this heritage to access, learn and possibly adapt these methods to their own local contexts.

WHY IS ACCIÓN VEREDAS DISTRIBUTED DESIGN?

We have begun to build an educational ecosystem that connects students with the real situation of a heritage in the territory, alongside other actors and a way of working that focuses on collaboration and the digital. Progress is documented and dialogue is encouraged to promote cohesion in the collective project proposed in the classroom. The sessions are designed to be dynamic, allowing for the creation, sharing and testing of proposed solutions. The resources generated will be openly distributed so that the experience and knowledge gained can be shared and adapted in different contexts.

In terms of regeneration, the project aims to recover the memory of craftsmanship in the region by understanding the past, listening to the present and proposing actions for its revaluation. In this way, its research as neo-craftsmanship also integrates methods that can be reproduced globally, while working with local resources and communities. Although the project still has challenges to overcome in order to achieve its objectives, it is based on a maker culture approach, based on doing together, promoting tangible and testable making, as well as sharing, providing and acquiring knowledge and resources to change the current realities of the heritage addressed.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

I would share a meal with my grandparents, all of them. It would be an opportunity to continue listening to them, to get to know each other better and to learn more about the realities of a world that is no longer the present one.

Financial Support:

This research is supported by the Predoctoral Programme for the Training of Researchers in the Canary Islands 2020 of the Regional Ministry of Economy, Knowledge and Employment, co-financed by the European Social Fund (ESF) with a co-financing rate of 85% within the framework of the ESF Operational Programme for the Canary Islands 2014-2020.

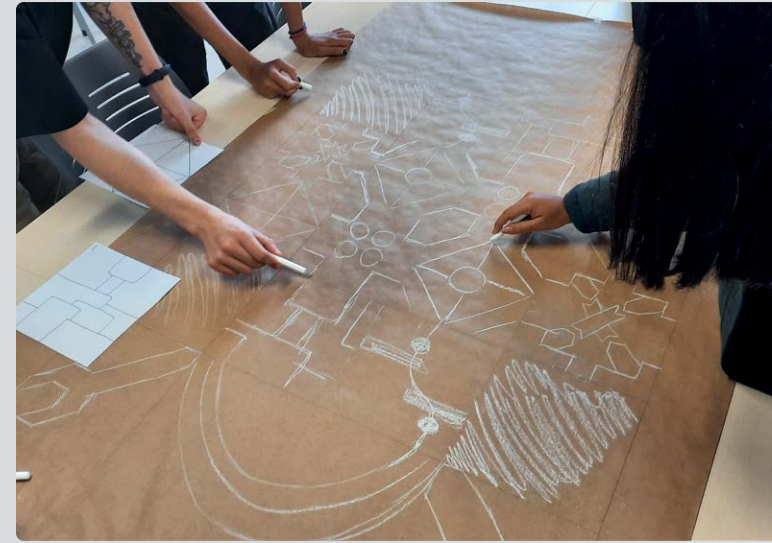


IMAGE 4. First sketch of the hydraulic tile carpet project (2021, Faculty of Fine Arts of the University of La Laguna, Arianna Fanio, CC BY-NC-SA)

IMAGE 5. Vectorisation of design proposals during the workshop (2021, Faculty of Fine Arts of the University of La Laguna, Arianna Fanio, CC BY-NC-SA)

IMAGE 6. Creation of hydraulic tiles in the classroom. (2021, Faculty of Fine Arts of the University of La Laguna, Arianna Fanio, CC BY-NC-SA)

IMAGE 7. Checking the result of a tile during the manufacture (2021, Faculty of Fine Arts of the University of La Laguna, Arianna Fanio, CC BY-NC-SA)

IMAGE 8. The final tangible result of the collaborative project (2022, Faculty of Fine Arts of the University of La Laguna, Arianna Fanio, CC BY-NC-SA)



Found Objects

An open-source design tool to rethink CNC wood waste into new building material

Project team

Jesse Howard, Marije Remigius, Iñigo Puerta Uranga and Paola Zanchetta

Organization

Fiction Factory

Location

Amsterdam, the Netherlands - Europe

Project type

Design tool

PROJECT DESCRIPTION

From FabLabs and maker spaces to commercial production facilities, digital fabrication tools such as CNC routers provide a dynamic way to produce custom objects with few restrictions in shape or form. However, this freedom also generates waste.

At Fiction Factory - a sustainable construction company based in Amsterdam, Netherlands - the Found Objects team embarks on a journey to address the factory's waste. Through collaboration with a multidisciplinary team, the factory is integrating an Open-Source design tool into its system. This tool aims to transform CNC leftover pieces into new building materials and valuable products. These creations have been showcased in various design fairs, building a community and inspiring other designers, makers and creative minds to join the waste-driven design movement.

CONTEXT AND HISTORY

In 2020, Found Objects kicked off as part of the Better Factory program, funded by the European Union's Horizon 2020 initiative. This program brought together a manufacturing SME (Fiction Factory, Amsterdam), an artist (Jesse Howard, Amsterdam), and a technology expert (the Institute for Advanced Architecture of Catalonia, Barcelona) to tackle the factory's urgent wood waste problem.

In 2023, supported by the Stimuleringsfonds Dutch fund, industrial designers Iñigo Puerta and Paola Zanchetta joined the team. Guided by Jesse Howard and Marije Remigius (Sustainability project manager at Fiction Factory), the duo of designers tested the Found Objects design tool, creating furniture prototypes with the pieces to develop a portfolio of products and techniques that highlight the project's potential.



Place

WHAT IS THE NEED IT TACKLES?

Fiction Factory is a construction company based in Amsterdam which produces custom-made B2B interiors from a diverse range of materials. For the past five years, the factory has focused on production with circular engineering principles. However, even with these principles in place, the production they execute creates a lot of waste: 78% of this waste is wood, and most of this wood waste is created by digital production on Fiction Factory's CNC machines.

Like many other production facilities, the use of CNC routers at Fiction Factory allows for the production of highly custom interiors with fast turnaround times. However, because the types of projects and engineered parts are constantly changing, it is not possible to fully optimise the material use. In general, an average of 30% of sheet material processed by CNC ends up as waste. For Fiction Factory, this means that they throw away an equivalent of 2,000 sheets of new material every year.



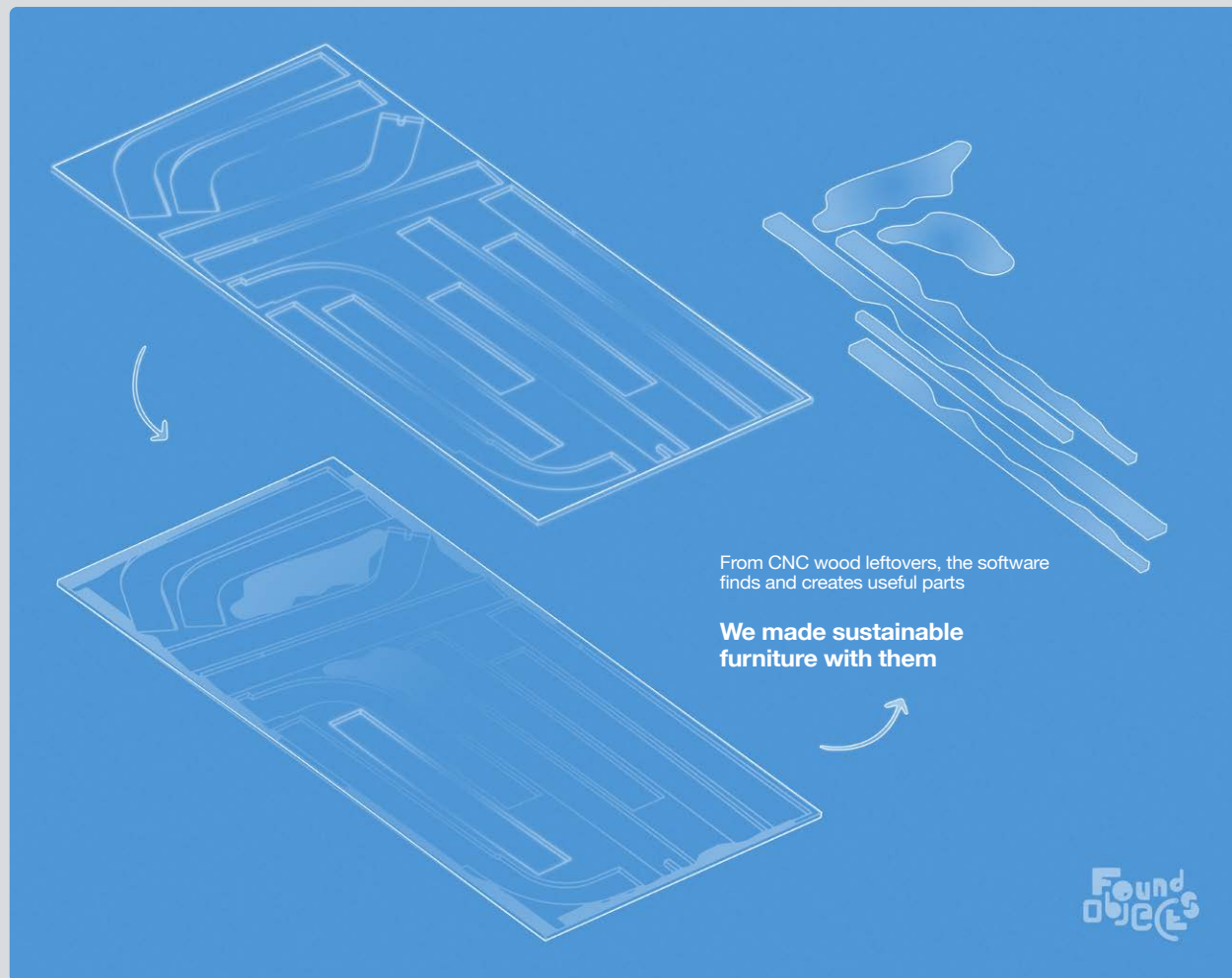
IMAGE 1. Found Objects project being exhibited, Waag Futurelab during GLUE Amsterdam (August 15 2023, Amsterdam, Iñigo Puerta Uranga)

IMAGE 2. Vincent Mesker, part of the Found Objects team, removed the leftovers from the CNC machine at Fiction Factory (Amsterdam, Found Objects team)

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Driven to fight the wood waste battle, Fiction Factory joined the Better Factory program, facilitating a multi-stakeholder collaboration, which sparked the idea to create Found Objects.

Found Objects is an open-source tool that transforms this wood waste into a new building material. It creates unique pieces from the leftovers. Each component is generated to fill in unused space before production begins. This means that while the exact shape of each part is determined by whatever is being produced, the dimensions and general forms generated can be controlled: from organic and curvy to angular and geometric.



WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

Collaboration has been the essential element driving the Found Objects project development from the very beginning. Since day one, a diverse group of individuals with a wide range of skills has joined the team, attracting various organizations to collaborate with the project in diverse ways.

IMAGE 3. A diagram of the shape creation process within a waste plank of the CNC machine, made by the Found Objects team (Amsterdam, Found Objects team)

IMAGE 4. Found Objects team, Waag Futurelab during GLUE Amsterdam (August 16 2023, Amsterdam, Martina Trebino Chavarria)



To operate with a multidisciplinary and multicultural team employ a holistic approach to problem-solving. To count on the support of Fiction Factory has been useful for the team to foster close collaboration and trust with the industry.

Following the development of the open-source design tool, the Found Objects team (Jesse Howard, Micah Ijst, Jonathan Lammerts Van Bueren, Vincent Mesker, Salomé Perez-Salas, Iñigo Puerta, Marije Remigius, Celina Van Zvijlen, Ricardo Van Leuwen, Paola Zanchetta) actively tested techniques to work with the new building material. Resulting in the creation of meaningful products to engage consumers, fostering an increased awareness of regenerative practices.

These designs were showcased at various 2023 design fairs (Milano Design Week, SOUP Studio space in Rotterdam, GLUE Festival Amsterdam, Dutch Design Week). At these events, the Found Objects team set up a workspace, inviting emerging material-driven designers to spend a day experimenting with the pieces and contributing their perspectives to the techniques and aesthetics of working with Found Objects pieces. The purpose of contributing to the design fairs during the last year, has been to create a Found Objects community: by engaging and inspiring designers, makers, and creative minds toward new ways of crafting meaningful products from waste.



WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

Every design decision generates economic, social, and ecological changes on a planetary scale. The production of interior design and ephemeral architecture demands certain materials (like wood) which are the planet's finite resources. We believe that what we treat as waste today could be seen as a resource, and systematically become a new raw material tomorrow. With Found Objects, we are taking the first steps to give a use to this material, before even it becomes waste.

IMAGE 5. A selection of designers and works that collaborated with Found Objects during the different exhibitions, from left to right: Marije Remigius, Jonathan Lammerts Van Bueren, Studio Waterfront duo, Olle Means and Vincent Mesker (2023, Netherlands, Inigo Puerta Uranga)



The commitment to re-design objects' lifecycles capable of reversing the effects of the industrial extractivist model, and to respond to material reality during the climate crisis by awakening customers' responsibility, is no longer an option but a necessity to face the collateral impacts of linear thinking. Found Objects is a project that breeds new ways of working, thinking, and valuing circular techniques, in order to produce technologies locally, which if distributed, will have a global impact of change for good.

WHY IS FOUND OBJECTS DISTRIBUTED DESIGN?

We live in a multi-crisis context and super-connected world, where the prevalent notion is that leftover materials are considered waste, leading to their incineration and subsequent environmental pollution (and many other systemic problems).

While the primary goal of the Found Objects project is to grow within Fiction Factory, empowering the designers directly involved and its broader community, the issue Found Objects tackles resonates broadly and transversely across the industry. The open-source design tool offers the possibility to parametrically work with Grasshopper, creating code operable with diverse digital fabrication machines, such as CNC routers, laser cutters, plotters, and more. Allowing the conditions to applying a circular approach to a diverse categories of materials: ranging from fabrics to composites and even stone.

Found Objects transcends being merely an open-source solution; it stands as a tool that cultivates the necessary conditions for both local and global industries to rethink their circles of influence. It serves as a catalyst to elevate consumer awareness and promote a paradigm shift from a waste-centric mindset to one centered around valuing resources.

Through an open and collaborative approach, the Found Objects team has successfully developed circular alternatives that are beneficial for both humans and nature.

IMAGE 6. Designs that showcase the potential of the Found Objects tool. From left to right: Hacked Rocking Chair by Paola Zanchetta, Wavelength Stool by Inigo Puerta Studio and Wavelength Lamp by Inigo Puerta Studio and Jesse Howard (2023, Netherlands, Inigo Puerta Uranga) Pérez-Salas Latorre)



IMAGE 7. Found Objects stand at Piet Hein Eek during Dutch Design Week (2023, 25/10/2023, Eindhoven, Inigo Puerta Uranga)



IMAGE 8. A workshop about Found Objects during Milan Design Week 2023 at the Circolare exhibition of Isola Design District (April 19 2023, Milan, Salomé Pérez-Salas Latorre)

The openness is emphasized to underscore the profound impact of open-source innovation in a critical context where quick action is essential to address global issues effectively.

The collaboration aspect is integral, empowering synergies within the Found Objects team and extending the positive work environment to a broader audience. Multidisciplinary and diverse teams, by pooling together collective knowledge, creativity, and energy, become a driving force for achieving impactful results.

The Found Objects design tool can be found on GitHub, allowing communities of designers, makers, and creative minds around the globe to implement it in their factories and maker spaces, supporting the waste battle, and celebrating the playfulness of working with waste and its transformation into value.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXNS, PLANTS, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?



Imagine sitting under ancient Amazonian trees, surrounded by the sounds of nature. Across the table, members of an indigenous community share their wisdom about regenerative practices with natural resources. As we delve into the feast prepared with ingredients locally harvested, the air is filled with stories of ancient traditions. This dinner is not just about nourishing the body; it is about feeding the soul with knowledge, understanding and a shared commitment to preserving the rich ecosystem of the Amazon. Together, we explore avenues of collaboration that transcend cultural boundaries, creating a harmonious melody of ideas that resonate in the rainforest.

Living with worlds:

Ecologies of practice and kinship



CHAPTER 3.

DRIVING DESIGN

VOLUME 2.

In the vast and interconnected web of life, we find ourselves entwined with countless worlds—each a unique tapestry of experiences, practices, and kinships that shape the very fabric of our existence. We delve into the profound interplay between our actions, the environments we inhabit, and the relationships that bind us.

From the intimate rituals of our personal spaces to the broader communities we engage with, we will navigate the landscapes of practice and kinship, seeking to unravel the threads that connect us to the worlds we call home. The term "ecologies of practice" beckons us to consider the intricate dance between our daily routines and the environments in which they unfold. From the smallest gestures to the grandest endeavours, our actions ripple through the interconnected ecosystems of our existence, leaving imprints on the worlds we inhabit. Simultaneously, "kinship" invites us to reflect on the diverse bonds that tie us to both the human and non-human elements of our surroundings. Whether familial, cultural, or ecological, these connections form the foundation of our identity and influence the way we navigate the landscapes of our shared worlds.

As we traverse the pages of this exploration, we will encounter stories of individuals and communities whose lives exemplify the delicate balance between practice and kinship.

Fouté-Difé

Unmasking Creole identity through the Carnival

By Emma Bereau

Fouté-Difé; to ignite the flames. The fire smouldering within me is now ablaze, fueling a profound curiosity about my identity.

Fouté-Difé; to liven things up. To bring out the spirit. In the carnival, as the drums and the trumpets set the mood, prompting the hundreds of feet pounding the ground in rhythm, the masses become one big wave that electrifies the spectators. A pounding that wakes the spirits inhabiting the land up, making them participants in this celebration.

In the lively streets of Guadeloupe's carnival, the resounding call of Fouté Difé reverberates, urging not only to kindle a literal fire but to spark enthusiasm for cultural exploration and remembrance.

As a second-generation migrant with a Swedish mother and a French West Indian father, residing in France, my roots are entwined in a complex narrative. My father and his siblings were part of a significant migration wave in the '70s, moving from Guadeloupe to France.

They arrived in a small village called Caylus, in the South West of France. He briefly told me about his childhood there:

"I remember I was around 7-8 years old when we arrived in this place. It was surrounded by old castles and there was green everywhere. What I remember vividly was the catechism classes I was going to every week. It was in the small chapel with the one pastor of the village."

This journey resulted in the erosion of certain cultural elements, including the Creole dialect, and a shift in beliefs and customs as they endeavoured to assimilate into metropolitan French society.

When individuals grapple with an unclear understanding of their personal history or heritage, it becomes difficult to establish a sense of belonging.

It is a sentiment shared by many West Indians.

The roots of this interrogation trace back to four centuries ago when French colonists brought slaves from Africa, China, and India to work on plantations across the French West Indies, including Guadeloupe, Martinique, Guyane, and la Réunion.¹ While these territories have evolved into distinct French departments since 1946, the legacy of slavery and colonialism continues to influence their social, economic, and cultural history significantly.²

The lingering effects of slavery have resulted in a nuanced and intricate narrative, creating difficulties for entire communities and successive generations to gain a definitive understanding of their roots and historical background.³

The historical plurality and complexity contribute to a fragmented sense of identity, leaving individuals with a sense of disconnection from their roots.

In navigating this intricate tapestry, the concept of Creole identity emerges as a unifying force that encapsulates and weaves together the diverse threads of this heritage. It becomes a lens through which individuals can begin to reconcile and embrace the richness of their collective history, fostering a deeper connection to their cultural roots and a stronger sense of belonging.

In that regard, Edouard Glissant a Martinican author, points out that we need to get rid of the representation of pure origins and consistent identities.

He refers to a specific term, creolization as "the meeting, the interference, the shock, the harmony and the disharmony between cultures, throughout the world-earth."⁴

Creolization represents the complex interplay of cultures, celebrating the richness that emerges when various cultural elements converge, intertwine, and evolve. It's a rejection of fixed boundaries and a recognition of the constant flow and transformation inherent in human cultural experiences especially in postcolonial societies. Glissant calls for "a visionary Tout-Monde (All-World)" where our dynamic, open identities are key to thinking about our future.⁵

Here, Creole identity can only be explained by its uniqueness: an identity that blends the tones, discourses, and genres of Caribbean peoples, European settlers, Asians, Indians, and Americans.

Growing up in France, a mysterious bond and fascination always drew me towards that distinct territory where a significant part of my origins resided.

Considering Glissant's argument, the Guadeloupean carnival represents a significant aspect of this particular Creole history:

It was introduced by the colonists in the seventeenth century as a celebration before the period of Lent.⁶

In Guadeloupe, where only the colonists could initially celebrate the carnival at the beginning of colonization, African slaves later added their cultural elements to this European-origin festival (drums, masks, songs, etc).⁷ The slaves saw this celebration as an unexpected opportunity to let loose but also to satirize their dominant masters, through colourful costumes.

Within the French metropolitan environment, my family was the sole community reflecting my appearance and shared experiences, amplifying the challenge of establishing a connection with my Creole heritage. This withdrawal led me to reflect on: How do I search for my Creole identity within the context of the carnival?

As I embark on this research, my conceptual framework is deeply influenced by Édouard Glissant's Poetics of Relation, particularly the notion of "le droit à l'opacité" - the right to opacity.

Glissant, emphasizes that in a multi-relational world, recognizing differences should not entail a demand for transparent understanding. Instead, he advocates for embracing the "right to opacity", encouraging accepting the unintelligible, impenetrable, and confusion that often characterizes cross-cultural communication. He demands "the right to opacity for everyone. [He] no longer needs to "understand" the other - that is, to reduce them to the model of [his] own transparency - to live with them or build with them."⁸

This perspective challenges the conventional approach to understanding otherness, moving away from a desire for clarity and transparency in intercultural exchanges. By acknowledging the right to opacity, one fosters a space where identities and cultures can exist in their complexity without the pressure to conform to preconceived notions of comprehensibility.⁹ This stance aligns with the ethos of my exploration, where the carnival becomes a realm of dynamic and evolving identities, resisting simplistic categorizations and inviting an interconnected understanding of the self and others.

There is an "interwovenness" that is illustrated in the carnival, as different groups and associations parade to tell different stories.

The beginning of the procession shows the fwétard, the whip-wielders. The whip "that subjugates" is used by the descendants of slaves in the carnival, in a phenomenon of inversion, to violently assert their desire to be the sole masters of their own lives.¹⁰ As they walk, they whip the ground to chase away evil spirits ahead of groups advancing to pounding calfskin drums. They are the gwoup a po.¹¹ Then comes the gwoup a mas, mostly young people wearing full masks and dancing to the instruments' beat.

This configuration of the Guadeloupean carnival took place around the '70s and '80s. Following the massive wave of migration to and from the West Indies, there is a consciousness of the community, an awareness of the complexity and richness of their identity that made the Guadeloupean population put more importance on the structure of the carnival.

This mirrors the ongoing quest I am undertaking. I grew up with the music, the sounds of the drums and the trumpets, and the rhythmic dance alongside my sisters.

It reminds me of the colourful clothes that I wear, and the scarves to protect my hair.

To illustrate this succession of groups, my research will be structured along these lines. Each chapter will be dedicated to an object, a mask, and a story linked to issues of diversity, migration, and post-colonial politics in Guadeloupe that are symbolized in the carnival.

The carnival serves as a metaphorical veil, allowing participants to express themselves freely through costumes, dances, and instruments.¹² They deliberately leave their artistic choices open to interpretation, sharing messages without expecting immediate comprehension. The Mas or masks, employed during this event become tangible symbols; whether hiding, revealing, or amplifying, they visually represent this intricate process.

The concept of rhizome identity further enhances our understanding of this "masking" phenomenon. Like the interconnected roots of a rhizome, identities intertwine and spread horizontally, creating a network of shared experiences and cultural expressions. Rather than a linear narrative, the rhizome identity is characterized by multiplicity, unpredictability, and interconnectedness.¹³

In exploring these masks, each telling its own story, I aim to showcase the complex and interconnected identities, forming a rhizome-like structure that binds us all together.

Through these diverse narratives, I intend to illustrate the richness of this entangled identity, emphasizing the impossibility of encapsulating these multifaceted stories within a single tale.

Immerse yourself in a descent into the complexity of identity, where each step is a question, each mask a story, and each défilé a unique exploration of belonging.

PART 1: THE CARNIVAL: A TRADITION AND A WAY TO REMEMBER.

The carnival acts as a longstanding cultural tradition that becomes a living archive, a vibrant spectacle that not only reflects the past but actively engages with it. Through the performances, costumes, and rituals of the carnival, the community engages in a continuous act of remembering, revisiting, and reinterpreting its history and identity.¹⁴ I will talk about some of those key elements here.



IMAGE 1. Drum player, Paul Rastocle playing at an event (November 18, 2017. Dalia Del Arte. CC-BY-SA 4.0)

The drum: a cultural being

The festive atmosphere of the carnival is marked by the resounding beats of drums and the distinctive sound of the chacha echoing through the streets. Imagine this irresistible call, drawing everyone towards the catchy rhythm that initiates the parade and unites the entire procession.

One noteworthy instrument in this procession is the ka, deeply embedded in the Guadeloupean culture. It is a drum made from goatskin attached to a barrel, assembled using a rope system. The wooden barrel, originally repurposed for packaging salted meat or wine during the days of slavery, became the resonant chamber for the ka.¹⁵ Its original acoustic characteristics made it a suitable percussion instrument. The use of drums and other instruments, crafted from animal skins, serves as a cohesive force, bringing together a diverse group of artists and instrumentalists. In essence, this instrument, through its history and material, is revered as a "cultural being", adding a profound layer to the carnival's musical landscape.¹⁶

I collected the testimony of Apollinaire, a ka player, on this matter. He says this regarding his feelings about playing the drum:

"It's not only an object, but it is also an evocation of a certain number of things: an instrument which, through its manufacture, takes the life of a certain number of living beings to try to transmit a voice to the instrument, a voice that can refer to spirits and ancestors. In Africa, there's no conception of a single, pure sound. The drum player never plays alone. There is a relationship between the tambouye¹⁷ and his instrument, but also with the person playing next to him, with the dancer who dances to the rhythm of the music. Everything is connected and intertwined, creating this connection between all the participants in a celebration. It's the same in the carnival."

Apollinaire expresses his deep connection to his instrument and fellow players. The drum becomes a vessel, not just for sound, but for the essence of life itself. It embodies a connection to the past, a tangible reminder of his African roots. This connection to his heritage underscores his yearning for collective unity and harmony in the collaborative act of making music together.

This assortment of voices, instruments, and dances in Guadeloupe is called Gwoka.¹⁸ The significance of this music genre in the carnival originates during the period of slavery. This music originates in the perpetuation of African music by slaves on former

plantations. The word's etymology is the Creole deformation gwo ka from gros-quart (large quarter), the usual capacity of the barrels from which slaves made their instruments. It can be compared to other Caribbean music: Martinican bèlè, Cuban rumba, Haitian rasin music, and so on.

For slaves, despite the prohibitions of the Code Noir¹⁹ music was a means of escape and communication, just like the Guadeloupe Creole language.

As Guadeloupe embarked on an identity quest, Gwoka played a pivotal role, bolstered by widespread propaganda efforts across the island in the 70's and 80's.

This cultural consciousness led to profound changes within the Gwoka realm, confronting increasing influences from modernity and globalization.²⁰ This search for identity led to the will to find values, and to look for landmarks. And naturally to look for the embodiment of these values. Gwoka transmission is now formalized through workshops, classes, and educational methods. District schools emerged, nurturing the younger generation and producing talented artists invited to international stages. This music, long frowned upon in white society, survived the post-colonial period, asserting itself as Guadeloupe's first music and dance.²¹ Drum making gained recognition, and the occupation of a drum maker was officially recognized in 2011 by the French Ministry of Culture. Additionally, the genre was inscribed on UNESCO's inventory of France's intangible heritage in 2014.²²

While originally confined to villages or the countryside, Gwoka nowadays occupies the entire Guadeloupean territory.

It is present in all the strata of the Guadeloupean population. This widespread presence reflects the integral role that Gwoka plays in shaping the cultural landscape and social fabric of Guadeloupe.

The défilé

While the Guadeloupean carnival maintains a general framework, it is essential to recognize that it is renowned for its spontaneity, creativity, and the active engagement of the community.²³

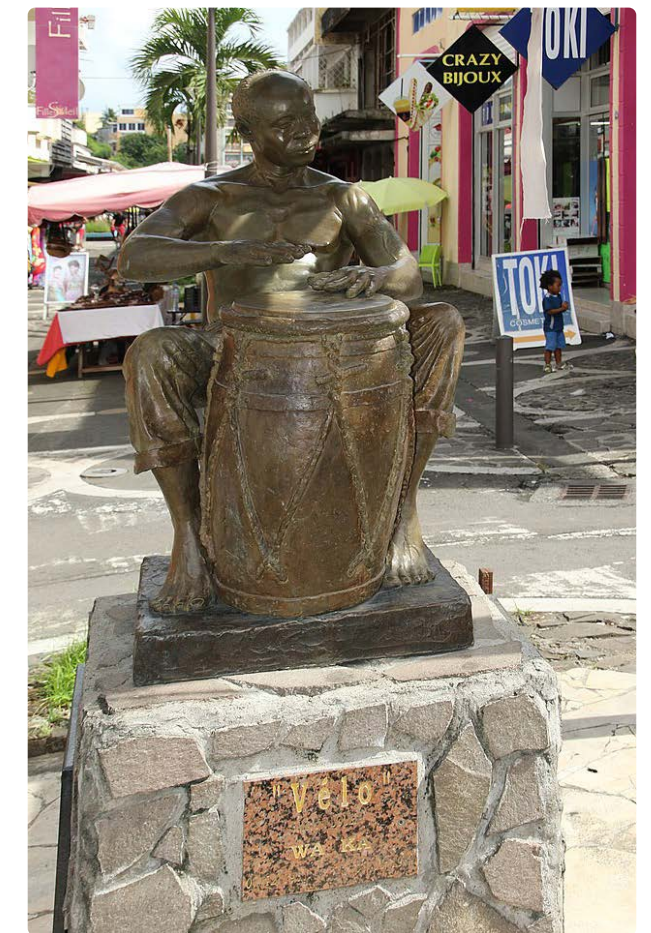
A good Guadeloupean carnival starts with a simple stroll, a slow pace of masses of people simply walking in the streets. The défilé is exactly that; an initial

IMAGE 2. Monument of the drummer Marcel Lollia, known as "Vélo", in Pointe-à-Pitre, Guadeloupe, Rennboot. CC-BY-SA 3.0

disorderly and awkward start, a tumbling that, enveloped by numerous participants, transforms into a unified entity walking in harmony.

From then on, voluntarily and consciously moving one's body becomes a démarche whose expression, through the walker's body in motion, can serve multiple allegories: that of progress, independence, self-realization, or encounters with others. Planned throughout the carnivalesque period, this défilé pop up where you least expect them, in an impressive tumult to translate the larel è on lèspri.²⁴ Once transformed, and materialized as a means of expression, the body becomes ideology. However big, thin, tall, or small, the men, women, and children are, their bodies suffer altogether in a collective effort, surpassing themselves in a unitary territory conquest, a common identity, a (re)construction.²⁵

Through an ethnographic lens—by following the steps of those anonymous bodies—we want to decipher the singular expression of bodies materializing a renewed collective identity claiming, by and through corporal use.



The Boula, makè, and chacha chant out the steps that pound the ground, leaving no one indifferent.

Jean-Michel, a member of Mas ka klé, a famous gwoup a po in Guadeloupe says on the subject:

"We are a disorder in an established order. The déboulé is something very rebellious, a spontaneous march based on music that calls for rebellion. As in a Mas music, we're in a four-beat rhythm, and in this rhythm, there's an instrument that makes you want to march: the double bass. There, the spirit is always present".²⁶

On this topic, my uncle told me about one of the first déboulé in France he organized, at Bercy (Paris) with his association in 1984.

He wanted to honour Gwoka musician Marcel Lollia aka Vélo who died that year. Vélo was a famous tambouyé who played the ka and was a leading figure in popularizing Gwoka.

Drawing parallels, I find myself reflecting on this event akin to spontaneous demonstrations witnessed in France or Guadeloupe following controversial political decisions. The term déboulé itself in French implies an absence of structure or organization, resembling an unplanned arrival that integrates into the flow of a street march. This comparison underscores the powerful and spontaneous nature of the déboulé, transcending its carnival context to evoke broader historical and social resonances.

My uncle continues:

"At the time we didn't have the costumes or all the accessories but we wanted to déboulé, to go in the street. We had a big desire to express ourselves." The enthusiasm radiates from his face as he reminisces about this event he orchestrated with his friends.

Mas Vyéfo, or about becoming a collective identity

We underlined earlier how the Mas and its significance were important in the carnival.

It's not just a question of having an idea of what the mask means, but of personifying the mask, perceiving it as a spirit that possesses the individual, causing a temporary loss of personal identity as one becomes the Mas and merges with the collective identity embodied in the mask worn by all participants.

In this regard, The Mas Vyéfo showcases a compelling example of this transformative experience.

Originating in the late 1800s, the Mas Vyéfo (from the french "Vieux Fort" that means Old Fort), stands

as one of the oldest carnival groups, established to preserve its rich tradition.²⁷ It is named after its birthplace commune, Vieux Fort, situated in the far south of Guadeloupe in Basse-Terre. Members wear masks with toques adorned with feathers and mirrors, once known as mas a miwa (mirrored masks) in the 1950s. Crafted from vibrant madras-printed fabrics, the costumes cover most of the body, featuring puffed sleeves and a face mask made from a metal sieve with basic painted facial features. The group dances to flutes, fifes, a triangle, and unique drums, playing a distinctive rhythmic pattern exclusive to them in this territory.²⁸



IMAGE 3. Mas Vyéfo in the carnival in Basse-Terre, Guadeloupe (March 5, 2019.)

From what my family explained it is really important to conceal your identity to become someone else in the celebration. Members of the Mas Vyéfo go to great lengths, even as far as hiding their costumes for the entire year from their own families until the carnival season arrives.

Recently, I delved into a live conference named "Encounter with Mas Vyéfo" held by Joel Raboteur, explaining the role and history of the Mas Vyéfo. The speakers, alternating between French and Creole, shared personal stories about donning the masks, immersing themselves in the transformation process, and assuming an alternate identity. This dynamic interchange created a captivating discussion, punctuated by gaps that compelled me to focus on nuances such as tone of voice, a fist hitting the table, and the audience's laughter to glean a deeper understanding of the context. One of them in particular, Nicaise Rénia spoke up. She's a resident of Basse-Terre and one of the rare Mas Vyéfo who is a woman, a tradition originally handed down from father to son.

With her booming voice and strong personality, she shared anecdotes about her husband, also a dedicated Mas Vyéfo. She emphasizes the immersive nature of their carnival commitment:

"I'd married a man. Robert. I thought he was a man but he was carnival. He breathed carnival, he ate carnival, he slept carnival, he woke up carnival, he worked carnival, he didn't work carnival. Everything was carnival! He was always in drag, picking up anything he could get his hands on to make his next costume. He'd see a piece of fabric and be like "Ah, we shouldn't waste it". He'd hoard all the different fabrics, Indian fabrics, madras, polka-dot fabrics, Saca²⁹, all different colours.

He was always different. He was not just becoming the Mas: He was a Mas. Oh, Mas-a-Robert, how I wish I could have met him."³⁰

As she recounts her connection to her husband, her words paint a vivid picture of a man completely immersed in the carnival spirit. By becoming someone else, he became one with the other participants.

His identity transcended the confines of the carnival season, and his one distinctiveness radiated through his perpetual pursuit of materials for his costumes. In capturing the spirit of "Mas-a-Robert", Nicaise's words resonate with a mix of bitterness but also nostalgia. She expresses a profound desire to have crossed paths with who she calls her "human husband". The legacy of Mas Vyéfo, as embodied by individuals like her husband, becomes a living testament to the transformative power of carnival, where identity, creativity, and the celebration of life converge.

PART 2: THE CARNIVAL: A WAY TO PROTEST AND TO QUESTION YOUR IDENTITY

In short, I could say that there's a carnival for oneself and a carnival for others. To conceive the carnival as a beautiful spectacle is to offer oneself in performance to the Other, and to expect in return confirmation of one's own identity, according to Marie- José Jolivet. She argues also that to emphasize the importance of strong collective participation in this spontaneous carnival is to advocate self-affirmation of that same identity. And yet, underneath these two forms of identity construction and their opposition, all the contradictions of this Guadeloupean society emerge.³¹

The conventional view of this assimilation is called into question: French culture ceases to be the object of undivided valorization, and the Creole group deems themselves assimilated but no longer claims to be exclusively so.³²

This is the context in which the current carnival resistance is taking place. A minority of participants with this mind shift try to distance themselves from this assimilation while affirming and defining their Creole identity. This, over and above contingencies, brings us back to the problem posed by the definition of Creolité, in terms of its future and its relationship to immigration.

The carnival, while a place of celebration and tourism, also serves as a platform for a protest carnival, where the figures of cultural marronage take center stage.³³ The term marron refers to slaves who fled their masters during colonial times, seeking freedom through traditional music, dances, and cultural expressions.³⁴ These marron slaves were symbols of resistance to colonialism and alienation. Recognizing and celebrating their history plays a vital role in healing and unifying the West Indian community.

Voukoum and LKP

The carnival gives the Guadeloupeans a newfound freedom: in language, self-expression, and the way we project our identity. Indeed it was urged for generations to favor speaking French rather than Créole in the French West Indies. That is what tells me as he reminds me of the choices his mother made while living in France:

"I didn't practice Creole in my childhood: my mother was a French teacher. She had set goals for her children, especially when we moved to France. She used to tell us, "You have to speak well!". To speak well was to speak French."

There is then a rejection of the French language in certain groups of the carnival and unlike previous generations, the use of Creole is encouraged.³⁵ I asked a member of a famous group a question on this matter:

"It's the Creole we speak (...) That's what gives Voukoum its strength and dimension. Making people aware that Guadeloupe is a country in its own right.

This member was from a group called the Voukoum group.

Voukoum: Mouvman Kiltirel Gwadeloup stands out distinctly from other carnival groups in the lower mainland, which focus more on festive activities and less on activism.

Among other ways of resisting, the Voukoum group is highlighting Guadeloupe's heritage with the use of traditional masks in the carnival through three main axes:

- To identify several well-known masks that have long been part of the carnival.
- Reworking somewhat forgotten masks by revisiting their conception and image.
- Inventing and creating new masks, based on an original reflection on the usual and traditional meaning of the oldest ones, in Guadeloupe but also other parts of the world.

These masks, seen as symbols of Guadeloupean identity under threat, have become focal points in the group's quest for recognition, defence, and preservation of the rich cultural heritage.

For the first axis, there is the classic Mas A Kongo, a prominent Guadeloupean Mas, that symbolizes the masks of bad slaves, of savages—an expression of the rebellious who couldn't integrate.³⁶

For the second one, the group reworked the Mas a Kòn (the horned mask), whose horns used to symbolize virility and fertility, celebrated in Indo-European carnival to protect the harvests of the new year. With the new values of Voukoum, it has become the symbol of the rural workers' struggle against the urban bourgeoisie. This is the allegory of "a herd of oxen that escapes from its pen and overturns everything in its path."³⁷

Lastly, the next example is illustrated by the movement's tribute to Liyannaj Kont Profytasyon (LKP).

LKP (collective against outrageous exploitation) was created in late December of 2008 due to the financial crisis following the first protests against the high cost of living.

It is a Guadeloupean collective that brings together some fifty trade unions, associations, and political and cultural organizations from the island. It is the main



actor in the big strike that resulted from twenty Mars to four April 2009. One of the aims of the LKP was to curb excessive exploitation in Guadeloupe.

Their hymn "La Gwadeloup sé tan nou, la Gwadeloup sé pa ta yo: yo péké fè sa yo vlé adan péyi an-nou", (Guadeloupe is ours, Guadeloupe is not theirs: they will not do what they want in our country) could be heard from miles on end to the beat of Guadeloupean music. With this song, the movement's participants claim "cultural and identity ownership" of Guadeloupe against the Pwofitasyon (outrageous exploitation) operated by the economic and financial monopolies that control the archipelago.³⁸

In 2019, during the carnival, the Voukoum group paid homage to LKP by creating a mask and a march to celebrate the 10th anniversary of the creation of the association. They called this déboulé, la Réprézyon.

It highlights the reciprocal relationship between sociocultural issues viewed in Guadeloupe and the carnival. The LKP played a significant role not only in reexamining Guadeloupean rights to their territory but also in reconsidering their Creole identity.

IMAGE 4. Mas Vyéfo in the carnival in Basse-Terre, Guadeloupe (March 5, 2019.)

The place of women in Guadeloupe and the carnival

While conducting my research, I came across a fascinating group known as Very Important Mas (VIM). It was created by a group of people, mostly women who did not feel comfortable in their respective groups in the carnival. Indeed, if the women are an integral part of the carnival and perform many of the tasks that make it happen, the most visible roles are filled by men. The carnival and its main participants, the musicians and Mas, are vastly men.³⁹

Although women are increasingly present in music and mask bands today, they are still predominantly male.⁴⁰

This surprised me as the Guadeloupean society is a matrifocal one.

This term means that it puts the mother at the center of the family or household. This is not a matriarchy because this would entail being dominant or in a position of power but rather it underlines being in the center.



As the sociologist Stéphanie Mulot says, "In certain Afro-descendant families, especially the most disadvantaged, decisions about the organization of family life and children's upbringing are still more often taken by mothers and grandmothers, and the primacy of family authority and the bond of filiation rests with mothers and grandmothers."⁴¹

It also means that the presence of the man, of the father in the household, is not necessary. There is no societal expectation for them to conform strictly to traditional roles of fatherhood and masculinity.

IMAGE 5. Young girl dancing gwoka in the streets of Pointe à Pitre in Guadeloupe (February 8, 2020)

In the context of the carnival and broader French and Guadeloupean society, the discrepancy between the matrifocal nature of the society and the male-centric roles in the carnival raises questions about the place given to women. This exploration of identity holds also particular significance for women.

As women are indeed given a certain space of role and identity in the making of the carnival they are forbidden certain areas for the sake of traditions. That's what a member of the Voukoum group says about traditions in the tambouyé world:

"Normally, in Haiti, for example, only a man is allowed to handle a drum. Women in Haiti are not allowed to play the drum. [...] It's a man who has the right to play a drum. Because a drum, is sacred".

Other members added: "In the old days, we didn't just let anything touch the ka. That meant also women. A woman shouldn't touch the ka because her sex, which gives life, shouldn't be involved in this art. Kozak, who's a ka master, explains that it's like that and that's it, there's no explanation to be given."

VIM emerged as a response to these limitations, creating a space where women can actively participate and contribute to the carnival, challenging traditional norms and fostering inclusivity.

Return to the Native Land

After conducting interviews with members of my family, I come to understand that the natural path to this quest of learning about this Creole Identity is to go back to the Native Land.

To go back is to ground yourself into this territory, and connect you to your roots.

My aunt, who started this journey to find out her origin after leaving the territory at ten years old tells me about this quest.

I start the video call at 8 pm, the sun is setting on this side of the globe. My aunt answered a few seconds later to tell me she was going to close the window because it was so hot in her house. It's just the middle of the day in Guadeloupe. The sun's rays are reflected in her living room, giving a welcome warmth to where I call her from. We start by catching up on how we're doing. She tells me about her morning shopping, as I tell her about my day.

I asked her more about her return to the land: "When I arrived a few years back in Guadeloupe, I was social and demanded. A lot of locals in Le Gosier were inviting me to every party, and I was making contacts for work. I became the "dame de compagnie" (lady in waiting) of people. I was the new "attraction". They

were very welcoming. But I remember a specific time when I presented my new partner, who is Guadeloupean, to those new friends. At the time I didn't understand because I was not Creole-speaking, but one of my friends was talking with him and at some point, he said to him: "Yé pa koné hein?" (she doesn't know, right?). At that moment, he understood that he made a mistake and from that point on, this group of friends didn't invite me anymore. Because then, I knew.

They knew that I knew that they were not telling me everything.

When I arrived in the Antilles, I had no idea how much I could feel estranged coming back."

This glimpse of her experience served me as a good illustration of the societal inclination to categorize individuals based on factors beyond immediate visibility, such as cultural background and language proficiency. It suggests that there are some unwritten rules and norms, and being accepted depends on following these unspoken expectations.

So what does it mean?

The knowledge and information are guarded and hidden from the uninitiated eye. Guadeloupean society is made up of families and clans.

In this scenario, the Other, whether they are the same skin color as the local or not, if they are not part of your clan or approved by your mother, is inevitably a foreigner. Indeed, small details make the difference between young migrants growing up in Europe and young people in Guadeloupe.

Those issues symbolized in the celebration by the Mas, can be associated with the concept of Lèspri (spirits) in the Guadeloupean carnival, highlighting the differentiation between Bon Lèspri (good) and Mové-Lèspri (bad). The reluctance to share certain aspects of identity and the challenge of being considered an outsider parallel the ambiguity surrounding the nature of spirits. Drawing a connection between these two realms suggests a shared complexity, where both the spiritual and social dimensions weave intricate narratives of beliefs, norms, and exclusions. Which may not always be immediately visible but significantly impact individuals' experiences.

It helps to reflect on the complexities of navigating Guadeloupean society, where acceptance and belonging may hinge on factors beyond one's control. The reluctance to share certain aspects of identity and the difficulty of integration mirror the nuanced dynamics that I explored in this research, highlighting the intricate tapestry of beliefs, norms, and exclusions that shape individuals' experiences.

CONCLUSION

As I explore the different strata of the Creole identity through the lens of the carnival, I understand that the connections from one chapter to the next are inseparable.

The topics that I discussed with several persons inherently exert a causal and consequential influence on one another, presenting a complex yet remarkably enriched subject matter. The carnival, in particular, is intricately interwoven with the economic and social fabric of Guadeloupeans, illustrating its indispensable link to their collective life."

Yet, the realization of my non-native background and upbringing brings forth the awareness that a portion of Guadeloupean heritage may remain elusive to me. In light of this newfound knowledge, additional questions may surface:

Is it imperative for me to comprehend and define this identity? Or would embracing the mystery and magic of the West Indies, allowing the carnival and its participants to speak without the obligation of interpretation, be a more fitting approach?

Ultimately, those stories and narratives are like an unbroken thread, allowing Creole identity to continually evolve without constraints, contributing to its inherent richness.

This confusion and entanglement reveal the richness of the territory that is Guadeloupe.

Seeds of Digital Reforestation

By Felipe Schmidt Fonseca from GIG and Northumbria University

*“Protecting what is left is not enough
As the voracious chainsaw cashes in
We need to understand it is already enough
And replant the forest”*

Gil + Gilsons¹

A few years ago, British author John Thackara was invited to present his book “How to Thrive in the next economy”² in the USA. In his lecture³, he urged us to “think like a forest”. The book draws parallels between various movements in communities worldwide, weaving alternatives to design tomorrow’s world today, as Thackara puts it. This vision of a common field encompassing multiple forms of action suggests that solutions to major contemporary problems should not be expected to come from a centralised grand plan. On the contrary, the way forward would be the complex and continued weaving of ultralocal initiatives that understand the conditions, culture, needs, and dreams of their immediate contexts. Naturally, each of these solutions has its obstacles and limitations, and that is precisely why it is necessary to find ways to create bridges of communication and understanding – connections – between them. Thackara’s book is an attempt to build those bridges.

I was reminded – once again – of that talk when my colleague Bernardo Schepop and I were presenting the semente project at a conference on Critical Infrastructures in Amsterdam in 2023. Bernardo is a designer who participated in the early stages of conceiving what would become the MetaReciclagem⁴ network, back in 2002 in Brazil. We reconnected twenty years later when I was planning a new phase in a series of collaborations between the University of Bristol⁵, the Neos Institute⁶ in Brazil, and Brazilian initiatives that are reference points in working with technology in communities. Since then, I have been working with Bernardo on several projects, semente being chief among them.

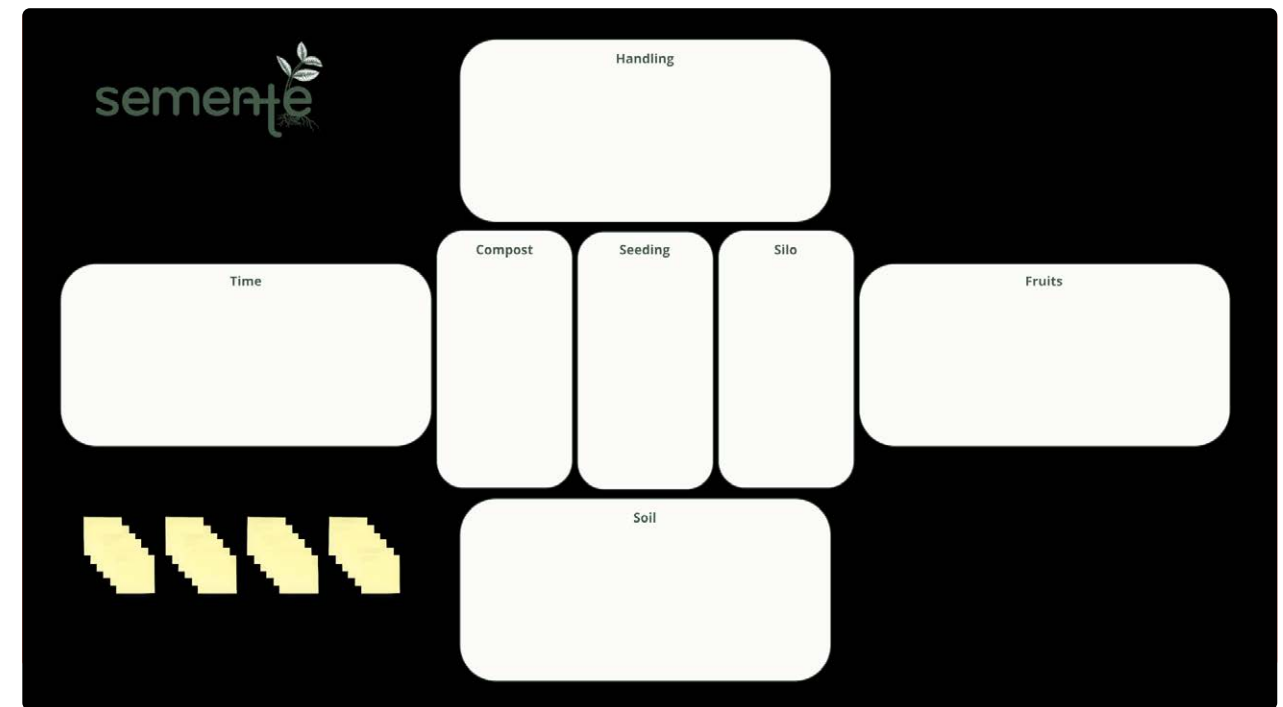
Semente is a collaborative tool for advancing community initiatives. We are working to distil decades of experience in open, people-centred, and participatory projects into a format for straightforward application. It builds upon previous work, especially the ID21 study⁷ and the fonte.wiki⁸ repository. At its core, semente prompts people to reflect on four

perspectives that, we believe, should be part of every attempt to develop ideas and desires in the community: soil (foundations, preconditions, prior experience), handling (practices, tactics, and their adaptations based on environmental observation and changes), time (cycles, memory, documentation, and planning for future generations), and fruits (expected outcomes, how to measure them and assess their impact).

We designed semente to be a dynamic and iterative method. It is currently shaped as a canvas in which those four macro areas (soil, handling, time, fruits) are set – to help map and project conditions, desires, long-term commitments and relations to what lies outside the community. The canvas can be approached in any order. At its centre, the other three areas aid in defining the particular identity of the initiative, or its seed:

- Compost is where we put all the decisions that can not yet be made. Points in which consensus is lacking, aspects that require more data to be collected, or factors outside the community that still need time, observation, and learning.
- Seeding is the heart of the community, so to speak. Here we describe who the community is in direct and indirect terms, what are its boundaries, how it sees itself.
- Silo is the place to preserve elements for later. Such elements can take many forms: accomplishments, principles, ethos to uphold, limits the community won’t overstep.

Beyond the name itself – semente is Portuguese for “seed” – the areas of the canvas echo, obviously, the choice of a set of analogies that refer to cultivation, care for plants, and the regeneration of nature. We had a first round of methodology tests in July 2022 during the Tropixel Semente Festival, in Brazil. Tropixel⁹ is an open space for critical discussion and building of alternatives connecting society, nature, and technology. Through a series of interactive sessions at that time, we collected feedback from participants coming from quite diverse walks of life. Those sessions left us with doubts about whether



to keep using analogies coming from vegetable cultivation and care. Would that approach condition the use of the tool to possibly cartoonish depictions of gardening? For some time, I accepted this question as unresolved and allowed myself to reflect further. It was only during the event in Amsterdam almost one year later, however, that I realised the importance of reaffirming these botanical metaphors that are also cultural – in the very sense of “culture” as cultivation: collective care for the continuous reproduction of conditions for life.

The idea of thinking about technology and culture as supporting the emergence and regeneration of life is not new, of course. As one among many possible examples: nearly a decade ago, Luciana Fleischman and I conducted a study on experimental digital culture – available here [QR code 1], in Portuguese. One of the interviewees for that study, Jorge Bejarano Barco

from the Museum of Modern Art in Medellín, stated that it is impossible to promote innovation without first fertilising the creative ecosystem. It is interesting to think about what this image – soil fertilisation – can suggest based on one of the strongest commonalities between Brazil and Colombia: the Amazon rainforest. Science says that the soil under the Amazon is relatively poor in nutrients, which surprises anyone who has had contact with that dense and vibrant ecosystem. What keeps the forest in continuous reproduction are not the pre-existing physico-chemical conditions in the earth below it but the ongoing transformation of organic matter into nutrients enabling the emergence of new life – an accelerated, constant, whilst arguably superficial and precarious cycle. And yet, the forest is there, dense and active, recognised as a fundamental asset for maintaining life in Latin America and the whole planet. This superficial layer of organic matter is called in Portuguese *_serrapilheira_* (“plant litter” in English, according to Wikipedia[10]). Many forest restoration projects adopt a strategy to restore vegetation in stages. They start using low-growing species with a rapid life cycle that protects the soil and creates basic conditions – plant litter – that will later enable the introduction of larger species.

On the other hand, it is always important to remember that the other humid forest in Brazil, the Atlantic Forest, does not achieve the same international prestige. Sadly, not even within the country. The estimates vary slightly, but it is a fact that around 90% of the original area of Mata Atlântica – which used to cover a large part of the Brazilian coast and extended so deeply inland that it reached over a thousand kilometres in, by the borders of present-day Paraguay

IMAGE 1. Macro areas of semente.



Read the study on experimental digital culture here

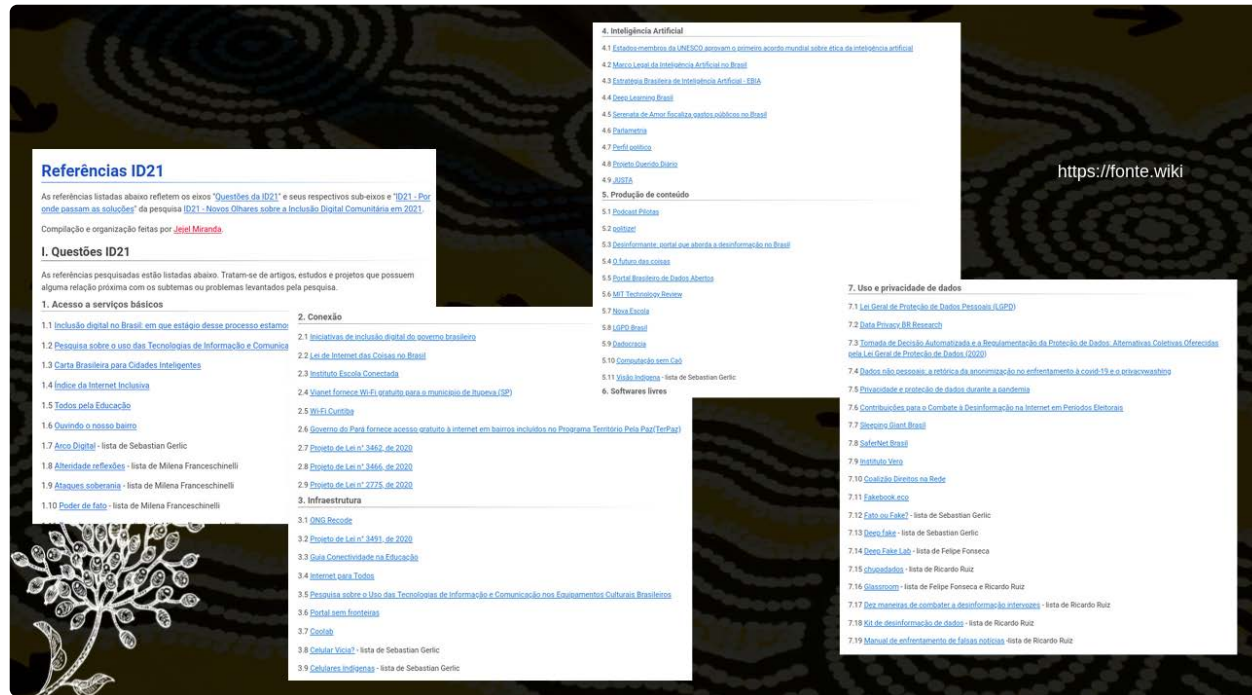


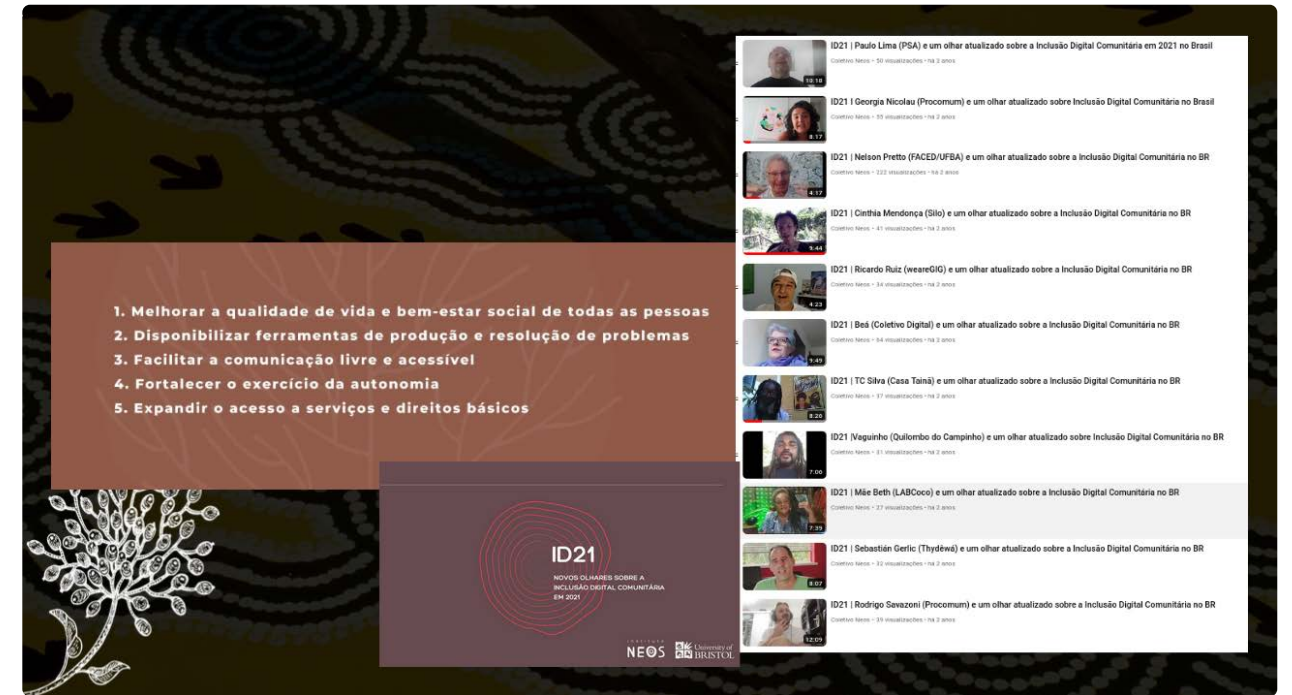
IMAGE 2. The semente canvas (November 2023 version).

– no longer exists as a forest. It went through centuries of destruction and species replacement, land grabbing, illegal occupations, and successive waves of exporting soil nutrients in the form of sugarcane, coffee, milk, soybeans, beef, and other commodities. Areas that used to be covered by dense multi-species forests have been transformed into mono-culture plantations for export. The effects of climate change have long been a concrete reality in inland cities in Brazil, which have become hotter and more prone to extreme events. This is a direct consequence of replacing the dense, diverse, and humid Atlantic Forest with what is sometimes called a green desert – hectares and hectares where only one species is cultivated. And yet, the less than 10% remaining area of the Atlantic Forest harbours a number of animal and plant species greater than the entire European continent. Analogies can certainly be superficial and lead to distortions or over-simplification. On the other hand, when used consciously, they serve as a way to provide perspective, organise thoughts, and seek inspiration from different knowledge areas, allowing us to find alternative ways of approaching situations. By employing cultivation and regeneration as central metaphors for semente, we are not merely thinking about recreational backyard gardening with seeds bought from grocery stores in industrial packages. I recall a discussion among several people participating in the Tropixel network, among whom I highlight the contribution of Fabs, Fabianne Balvedi. The topic was digital permaculture, a theme that had emerged in other networks related to Tropixel and that Fabs brought to the table. We discussed the limits of the analogy of “gardening” (which, I admit, we used quite a bit in the past when discussing the daily work of

editing and maintaining the content of wiki sites). Illustratively, in 2022 a European politician suggested¹¹ that Europe was a “garden” and the rest of the world a “jungle” trying to invade it. In this context, I obviously cheer for the jungle. Quite to the point, that enclosed form of gardening as something imposed onto the environment by human hands, taking the form of an artificial construct to isolate itself from nature, does not work for what we intend to develop with semente. We are more interested in drawing inspiration from integrated and systemic perspectives – permaculture, agroforestry, and bioregional thinking that integrates city, countryside, and nature.

That is the backdrop of our contribution to regenerating public technology policies with a focus on communities. Metaphorically, the seed is but a small piece in a complex scenario. It should be understood as an elementary unit for conserving and propagating the genetic diversity of certain plant species. It is important to emphasise this: the seed does not create clones. It is not about automatically replicating the DNA of a specimen, in the sense that some mistakenly interpret it with images like the “selfish gene”. It is not about DNA conservation, but rather it's remixing with the present environment. The seed speaks of diversity and multiplicity, not repetition. It is an element of memory and rebirth, connecting all previous generations with the current development conditions: soil, water, sunlight, among others.

The semente toolkit emerged from a process that



started three years earlier amidst the COVID-19 pandemic. At that time, the University of Bristol was interested in understanding the landscape of media appropriation and digital technologies in Brazil to inform a creative project that was being conceptualised. To meet that expectation, I assisted the Neos Institute in Brazil in designing and managing a survey in which we conducted short interviews with key individuals who had been involved in various initiatives of what was called “digital inclusion” in the early 2000s. The interviews with those individuals shed light on the importance of discussing the consequences of the dismantling of public policies in the years since the political coup in 2016. In the project report, titled ID21¹², this absence of policy was one of the most striking points. It is important to remember that in 2021, Brazil was governed by an extremist regime with authoritarian aspirations, which rejected much of what had been developed previously in fields related to human rights, social inclusion, and cultural diversity. Development policies for Brazilian digital culture, social participation, and representation of differences no longer had the institutional support they had previously enjoyed.

IMAGE 3. Graphic documentation of Tropixel Semente by [Marina Nicolaiewsky]

What made me realise the relevance of insisting on the agro/botanical analogies of the semente project during the event in Amsterdam was precisely the fact that, when presenting it in an international context, I saw myself referring to that period of policy dismantling in Brazil as one of desertification. I also suggested that the multitude of initiatives that had developed there, mainly between 2002 and 2012, was, in contrast, a forest of initiatives. It is important to emphasise this image again: at that time, we did not have a well-tended garden or a monocultural plantation of projects. It was a complex forest surviving through movement and invention, thus surpassing precariousness. There was a lot of experimentation, we had many mistakes, a lot of intentions did not take root. And yet, even though many of the people involved suffered the effects of a lack of predictability, bureaucratic difficulties, the absence of an overarching strategic vision, and competition for scarce resources, all while combating idea thieves and ill-intentioned opportunists, still there was a continuous creation of life, the building of symbiotic alliances, flourishing where least expected. The following stage of cooperation between Neos Institute and the University of Bristol aimed at responding to another condition: the involuntary evanescence of collective memory. We suffered the disruption of access to the online portal of Brazilian digital culture, where numerous projects had documented their processes and discoveries, references, and productions. To investigate the question of what remained of those initiatives of digital inclusion, we created the online repository fonte.wiki. There, we set out to prototype an environment to organise and share lists of references and content

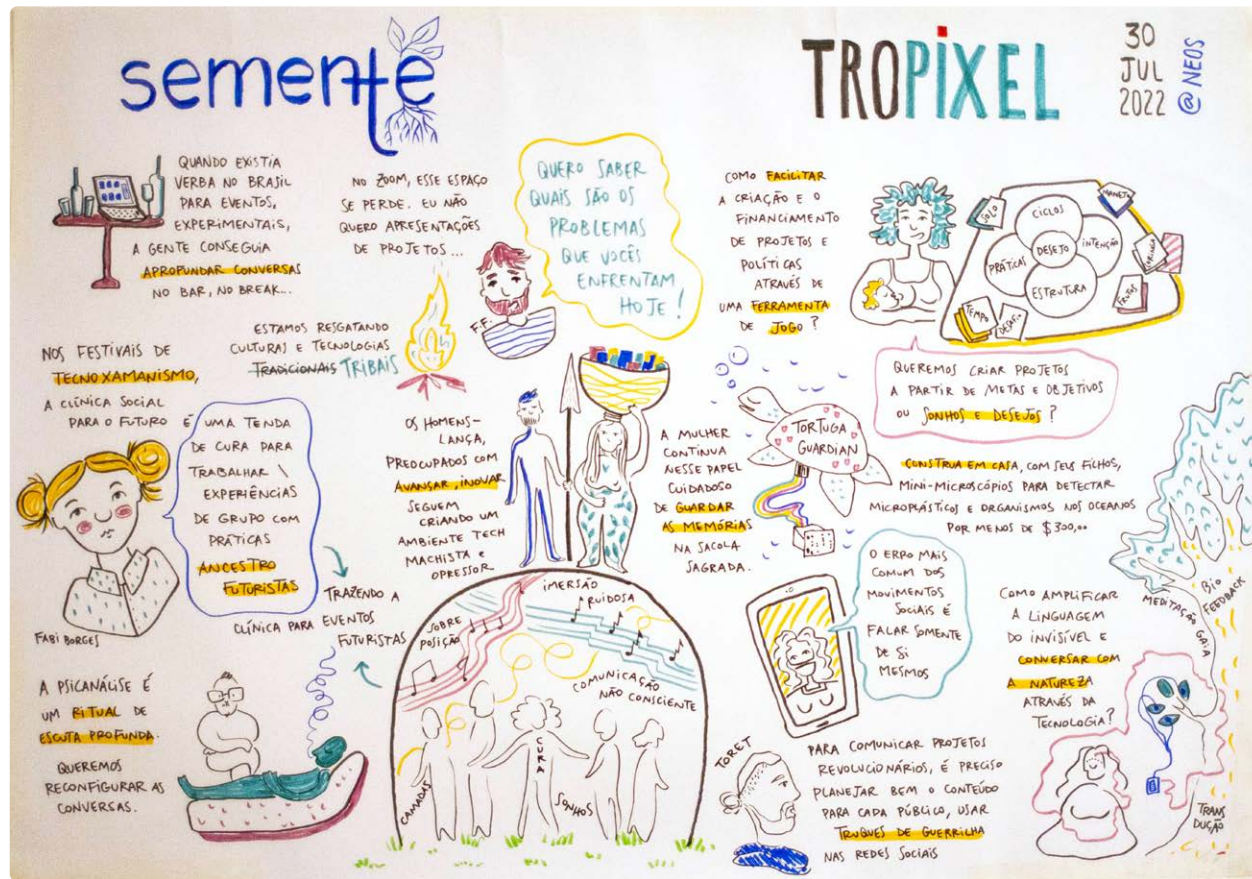
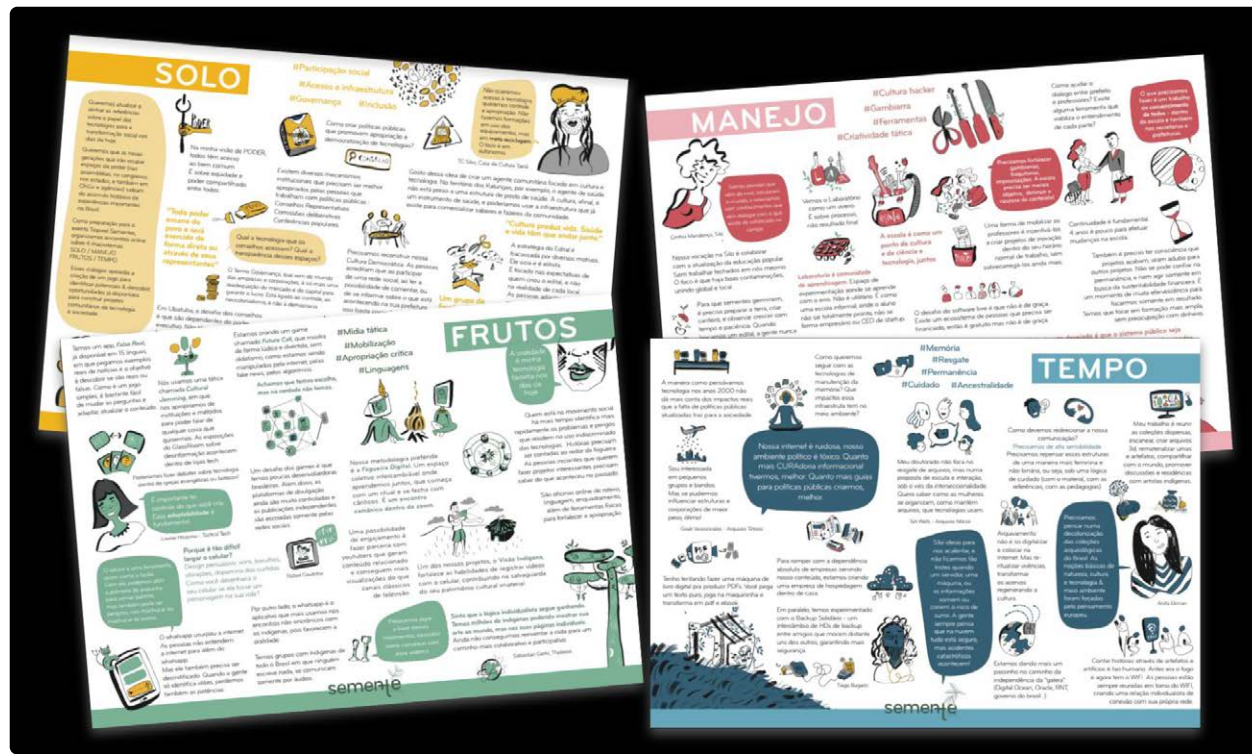


IMAGE 4. ID21 study. Report available

IMAGE 5. Sample of contents in [fonte.wiki]

that serve as a basis for many projects interested in community-based digital public policies. Obviously, the choice of the term fonte (Portuguese for “source”) evokes the role that free and open-source software played in the origins of Brazilian digital culture, where numerous projects had documented their processes and discoveries, references, and productions. To investigate the question of what remained of those initiatives of digital inclusion, we created the online repository fonte.wiki. There, we set out to prototype an environment to organise and share lists of references and content that serve as a basis for many projects interested in community-based digital public policies. Obviously, the choice of the term fonte (Portuguese for “source”) evokes the role that free and open-source software played in the origins of Brazilian digital culture. But the fonte in Portuguese can also be read as “water fountain” – the constant supply of water, capable of countering desertification if properly managed.

Recently, many initiatives have emerged that aim to help people – even those with limited technical knowledge – understand how technologies work, the implications they have in our lives, and how we can minimally mitigate the risks they bring forth. These initiatives are of utmost importance, focused on individual and collective defence and protection. In the context of the analogies I am discussing in this text, I can see them as conservation initiatives. However, one must wonder how to go beyond mere conservation and move towards regeneration, reforestation, and valuing what escapes the framework of gardening and mono-culture.

With semente, we take a different path from many open methods for building technology-based projects that assume the need for a project leader. We equate such a character with the prototypical gardener – usually a man, white, educated, with knowledge of multiple languages and ties to powerful individuals – who convinces the world to help care for the outcomes of his store-bought seeds, whilst killing wild species and other competitors. Our bet, on the other hand, is to always start observing and creating relationships, discovering who the community is in all its diversity of knowledge, aspirations, and levels of involvement – our dense and complex forest – to collectively build what we want to be together.



Follow the development of semente on Github



Read an updated version of the article on the blog

Decolonial Futures

Dreaming the world into being through ritual and ceremony

By Nyangala Zolho and Zinzi de Brouwer



IMAGE 1. A shell cusp within gentle hands. 2023. Credit: Amber Zeekaf.

As the world experiences volatile injustices, waves of rupture unfold in ways that are being called unprecedented. In the face of political and intellectual paralysis from the world's hegemonic leaders, decolonial perspectives take poly-crisis to be a global awakening. The decolonial lens on what it means to consider the future, not as a distant and separate temporality to be attained but rather as a present geopolitical and interconnected existence to embody and create from, gives way for a kind of innovation that might break the cycles of reproduced violence. The premise of this article begins with a provocation: a calling for an interconnected embodiment that is seeped into the plurality of our lived experiences that naturally calls for the redefinition of what "resistance", "justice" and transformation are.

By exploring beingness as the entry point to unlocking ancient futures, and how through building new (self) healing practices we hold sovereignty that can make way for transformation that decolonises, this article provides examples of how we might respond to the crisis of our times. In the words of Angela Davis who questions existing responses to crises by asking, "How can we [...] create a framework that allows us to think about these issues together and organise around these issues together?"¹ - this article looks to show how this may be.

Firstly, we trace what decolonising means in 2024 and explore what self and system have to do with a reckoning in the Anthropocene. This article then delves further into designed ceremonies - as found in Bulgaria, as well as traditional Shamanic practices of the ancient Inca - in which rituals and ceremony allow for de-centring the fetishisation of resistance or intervention (control) and instead uphold beingness as the entry point to authentic transformation. Finally, to conclude, commentary on how this new framework might allow for more inclusive imagined futures leaves room for others to reflect on how beingness might influence their own practices of and for a better world.

WHAT DOES IT MEAN TO DECOLONISE IN 2024?

The decolonial theory exists in multitudes by proxy of being a response and reaction to colonial imperialism (in its many forms) and the continued existence of coloniality that we see today. Practices of conquest, of domination over land, peoples (native or enslaved), and ultimately the self is anchored within a politics of knowledge that is the ontological bedrock which allows violent coloniality to continue to reproduce itself long after treaties of "peace" are signed and nation-state "independence" declared.

Decolonial theory concerns itself with the insidious ways that violence resulting from coloniality reproduces itself; within the self/individual,

interpersonal, political, material and ecological world. When we speak of decolonial work in 2024, the self and system have a central place - that is to say, any decolonial practice that ignores either end of this spectrum falls short of true decolonising work. Coloniality can in many ways be seen as coded technology or design that encodes racist, patriarchal and socio-economic violence through imperialism. Through this understanding, racism (as one example) becomes 'an output of technologies gone wrong, but also an input, part of the social context of design processes'² that weaves itself across space and time, adapting and attaching itself to past, present and future 'isms' that allow for its continuity. Coloniality is persistent and pervasive.

Mendoza's (2020) comparative analysis of decolonial theory critiques the lack of intersectional analysis of different colonial experiences³ that have their particularities but also many interconnections and continuities. They end poignantly by highlighting how decolonial theorists have taken for granted their roles in coloniality, stopping short of what decolonising actively means⁴ - falling short of critiquing their own situated placement. Decolonising must seep through our ways of being, knowing and creating. It must be trans, global, and multilayered if it is to begin to transform away from conquest, not just of indigenous, black, queer peoples⁵ but also of land; to oppose rather than reproduce the violence that persists. We fall short when we fail to take into account the totality of these interdependencies and entanglements.

Borrowing from the works of black feminist theorists^{6,7,8}, we can begin to uncover answers for what decolonising works might mean in practice - as a starting imaginary. In the early nineties, bell hooks spoke of radical self-love. Radical and resistant towards racism, sexism, and consumerism (entangled 'isms') that had then taken over mass culture (and continue in new ways today). Hegemonic capitalism decentred the self to connect it with consumption - 'I shop therefore I am' said Barbara Kruger (as quoted by Bell Hooks⁹). Hooks' reckoning with the entanglements of multiple dimensions of violence is what makes their work so relevant to decolonising practices, even decades on. Audre Lorde also speaks of self-love and introduces the active practice of decoloniality when they refer to 'the master's tools will not dismantle the master's house'. That is to emphasise how deeply intentional transforming out of coloniality must be, so as not to reproduce it. Finally, Angela Davis is more closely aligned with traditional academic decolonial theory and provides the context of transnationality: how freedom for one must mean freedom for all (from self to system).

'We cannot simply look at gender in isolation from race, from class, from sexuality, from nationality, from ability...we constantly have to make connections'¹⁰ said Davis pointing specifically to the systemic links

between what happens in the United States to Black people with the Palestinian resistance, back in 2014. Decolonial work can therefore be taken to begin with the self, to be an active reckoning, and inherently linked to processes of transformative creation; be they geared towards critique, resistance or system shifts which this article introduces as a beingness.

SELF AND SYSTEM

“...to recognise the divine in everything. When we acknowledge that the earth we walk upon is not just dirt, that the trees and animals are not just resources for our consumption, then we can begin to accept ourselves as spirits vibrating in unison with all the other spirits around us.”

- Sobonfu Some.¹¹

This article, while connected to the history of decolonial theory that paved the way for this ontological approach in academic circles, is mostly concerned with an ancient way of beingness that gently, naturally moves into origins of systemic relating[12]- a way of being that has always been. While this knowledge is shared in a form that lends itself to a colonial form (despite the efforts of us as authors, editors and publishers) what is shared as an imaginary below is as easy as the gentle wind that weaves its way through tall grass. There is no resistance to what just is - only movement and transformation.

When we speak of the self, we take into account how we centralise our lives and how we organise our beliefs, emotions, and actions around it. In a Westernised context, individuation seems to predominantly reign the healing and esoteric spaces. According to Jungian psychologists, the concept of individuation expresses itself in a process of finding purpose in life, a union of polarities, finding the meaning in living and how this forms part of the collective unit. In contrast to Freudian psychology, in which the self is seen as a by-product of the ego, the psychoanalytical approach of Jung (1931)¹³ sees the self as a mystery. It is in this mystery that holds the void to unravel the discovery of self in a continuous motion. In this respect, the self could be understood as part of the beingness of a collective sphere, developing a deep intimacy with life itself. It is the opposite of individualism. From here, embodiment practices as part of ritual and ceremony, as reflected upon later in this article, offer reconnection with the body as gardens of truth as part of an expansion of consciousness.

Beyond the self being part of the collective sphere, we can also argue that the self is in fact the very system we are decolonising out of (countering claims of separation). “These big crises that we face, in my

view, are not a crisis of the outside world. They're a crisis of our relationship with the world,” says Indy Johar¹⁴ in relation to this. Therefore when we speak of “resistance”, “justice” or “transformation” in response to coloniality, we are very much speaking of work that must begin and end within the self-system. Healing the self becomes the radical and disruptive starting point to decolonise from what Audre Lorde called the ‘Master’s House’.¹⁵

By taking the example of Innerdance¹⁶, a healing practice that was founded Pi Villaraza in 2006, this article considers embodiment as a playground to explore and transform the self. Pi, as he likes to introduce himself as, set out on a pilgrimage that would take him to live on a remote island of the Philippine Archipelago solely living off of coconuts. He spent two years on this island meditating in the mountains, when his body started to engage in movements that were not manipulated or controlled by the mind. This is when Innerdance was born, which eventually branched out to similar embodied practices such as Kundalini Awakening Process (KAP) and Lifeforce Awakening. The process of Innerdance in its essence contains a simplicity in which the participant is asked to lay on the floor, guided by a playlist that mimics and stimulates one REM sleep cycle. After studying the practice for many years on thousands of participants, Pi delved into scientific research to understand the neurological phenomena that occur and how the nervous system is able to respond to the music and the guidance of the facilitator in order to create deep states of healing on a bodily, emotional and spiritual level. Furthermore, a certain autonomy was discovered in the ability to self-heal and how the intelligence of the body contributes to the energetic process that the participants experience. Deep states of bliss, awakenings and feeling more in tune with life have been just a few of the lasting effects of those who undergo the Innerdance experience. Scientifically, Pi has sought to explain the positive long-lasting effects of the practice in regards to how the sympathetic nervous system and the parasympathetic nervous system are stimulated during the session. Innerdance as a practice forms its basis on trust, trust in the ability of the Self and bringing it into a state of allowance which further cultivates the beingness mentioned previously.

Therefore, the embodiment becomes a place where true resonance is felt, in order to create the right conditions for the beingness to embrace its wholeness, only to find out it has been there all along.

FUTURES AS AN APPROACH

Having explored decolonial theory, and the self in relation to the system, it is only fitting that we address the term that gives name to this article: futures.



Futures methods have traditionally been conceived of as a methodology to help companies and governments navigate uncertainty¹⁷. Futures methods (including but not limited to futures scenarios, foresight and horizon scanning) are an exploration that prepares actors for the multiple possibilities that might occur in the near and far future. But what role does a futures approach play if we remove production, consumerism or control from the equation of desired outcomes resulting from futures work? To answer this question it is important to explore time and space from non-Western perspectives.

IMAGE 2. Ceremony set up. 2023. Credit: Amber Zeekaf.

In Eastern philosophy such as Zen Buddhism there is the concept of being-time - uji. Time is linked to past, present and future Karma that is both individual and non-individual (also referred to as common, shared with other beings) - energy produced by our action¹⁸, ‘Uji’ can be studied at length, and might be a whole other article on its own, but the importance here is in the agency that exists with this concept. Karma is something to accept (that the only constant of life is change/impertinence) and act on (because there are multiple possibilities we can tap into).

In African (Bantu) concepts of time, there is also interconnection. That is to say that the far past (ancestral time), past, present and future are considered holistically. Similar to ‘uji’ much is lost when this ontological notion of temporality is translated for legibility in Western context¹⁹- with harmful impacts on Africa’s heterogeneous communities (which have their own particularities). Nonetheless, the resistance towards confined time-space in favour of a holistic ontology points to both an agency in shaping the future (the future is in this conceptualisation of the present now) and an inherent beingness (because the only certainty is change/impertinence).

If we take Aboriginal cosmology, we may also identify a beingness in “The Dreaming” where past, present and future self exist at the same time but on different levels. What is most noticeable is the inclusion of deep earth time (which includes the far past and the far future). With this decolonial lens, what is happening to the earth today is not viewed in isolation to what has happened since the beginning of time and to eternity (when plant life will survive but the human species may not²⁰). For the Indigenous of Americas, there has also been a critique of utopian or apocalyptic visions of the future that derive from structures and continued histories that remain based on coloniality-genocide, enslavement, ecocide, and total ruin. Instead, futures must tap into the real examples of indigenous ancestors who lived long after many apocalypses that have already taken place on earth (with no corporate strategy or five-year governance plan).²¹

“We exist at once with our ancestors and unborn generations. Our future is held in our hands. It is our mutuality and interdependence. It is our relative. It is in the creases of our memories, folded gently by our ancestors. It is our collective Dreamtime, and it is Now. Then. Tomorrow. Yesterday.”

- Indigenous Action

So what does this mean for a futures approach that moves away from Western epistemology? The future ultimately becomes the very nowness and beingness - that is not passive, depressive or apathetic but very much alive and shaped by resistance as simply being. Moving beyond the “exploration” of possibilities, decolonial futures seep deeper into shaping and

constructing possibilities away from coloniality and violence that might also be recognised as the need for control and exploitation. This is the construction of space that is gentle, inclusive and that allows for the (self)determination of common futures. A 'common' that can also extend beyond humans to include non-humans such as the planet and its ecologies.

RITUAL AND CEREMONY

Since the beginning of time, humankind has leaned towards ritual. Ritual is one of the characteristics that might be said to distinguish human from non-human. In Palaeolithic caves, sacred circles formed by stones were found with tracings of human feet suggesting ritualistic dancing (movement) and recently the oldest ritual discovered by archaeologists was found to date back 70,000 years to Botswana. Here in the Tsodilo Hills that are sacred to the indigenous San peoples, homo sapiens rituals sacrificing spearheads (designed tools) to the Python were found - the oldest ritual and ceremony we know of today.²² From these origins, ritual and ceremony can be seen as the vehicle by which we can explore possible ancient futures beyond our imaginaries; in ways that shift self and system or the self-system. Furthermore, ritual and ceremony places the participants in embodiment practices in which the relationship between the natural elements of life is invoked through chant, cheer, dance, music and food (also to be seen as acts of transformation).

“Going to church or temple has not satisfied this hunger, surfacing from deep within our souls. Organised religion has failed to satisfy spiritual hunger because it has accommodated secular demands, interpreting spiritual life in ways that uphold the values of a production-centred commodity culture.”

- Bell Hooks

So what might it mean to create from a spirit of ancient futures today? Rituals and ceremonies offer us a few examples of what this already looks like.

In North Eastern Bulgaria in the summer of 2023 a group gathered in a small village called Oslen. Bulgaria is a mountainous country with a vast countryside that offers many untapped opportunities as rural places face a myriad of social challenges, from low levels of economic participation from rural areas, shrinking working age population and low educational outcomes²³. From this context emerged a desire to revive village life and form new bonds that might foster a higher quality of living for young families wishing to relocate from the city and those who had remained in rural Bulgaria but with decreasing living conditions. Fifty people (artists, innovators, engineers, musicians, parents and children) came together to discuss the future of rural place(s). Prior to exploration about the

future, scheduled for the final day, those present were guided through ritual and ceremony. At sunrise, through gentle movement a coordinated dance known as paneurhythmy opened the day to clear the mind and connect with place and the cosmos. Breathwork and clay play helped guide explorations of self (past-present-future) prior to exploration of what was desired from a common future.

What emerged when the futures exploration finally took place was a clarity and openness of both individual and common-goals, and mostly the importance of holding both at the same time. During the discussion themes of individual desires for freedom versus the fear of reproducing inequitable structures sat side by side with desires for healthy spaces for young people to grow up in versus there not being sufficient stimulus in rural life, and the reproduction of what previous generations had experienced (that led to the exodus from village life in the first place)! War, ecological disaster and loneliness sat side-by-side with feelings of kinship, thriving ecological harmony, a sense of true belonging. Organically a space was created for the multitude of possibilities to emerge from self and in direct relation to system, and for the collective to think of the kinds of decisions they might make in the present to enable the desired futures they wanted - to shape the now.

Ritual in this example was weaved as individual practices as well and the gathering itself being curated as a guided and co-created ceremony. There was a scaffolding to allow individual introspection as well as the facilitation of collective beingness in action. From this beingness emerged other collective possibilities: decisions about what might need to happen next to enable desired futures, connections between unlikely actors, shaping power structures that had already started to organically emerge, the building of artefacts to illustrate provocations explored in one time period in another future period, with others who might want to engage. Ritual and ceremony served as an entry point into all these elements.

In Peru we might also find another example of a source to ancient futures. When we regard ancient indigenous elements that inspire present-day rituals, the Q'eros, a Quechua-speaking indigenous tribe from Peru, have left a legacy that is still present and growing globally. The Q'eros are descendants of the Inca people who were invaded by the Spanish Conquistadors in the 1500s. Due to the colonial upheaval during the Spanish Inquisition, traditional medicine practices in Peru were often regarded as witchcraft. The Incas fled to the 'village in the clouds' in the highest altitudes of the Andes where the priests (Pacos) long safeguarded their shamanic practices. One of the oldest and ancient shamanic lineages, the Incas kept their rituals hidden from the colonialists and ensured the tribe did not have any contact with the modern world until the 1950's. Around this time



they began to fulfil the prophecy that it was time to spread their traditional practices with the world, as the Inca shamanism was to play an important role in the collective liberation and healing of the planet.

The Four Winds Society, founded by Alberto Villoldo, Ph.D., has played a significant role in the last 25 years in spreading and bridging Indigenous traditions with modern psychology. Villoldo, who is a medical psychologist and anthropologist, has been working with the Q'eros since the 1980s, bringing forth shamanic rites of the Andes whilst installing the importance of Earthkeepership in those who seek to dream new worlds into being. The Andean mysticism holds belief that everyone has a seed of Inca within. Their deep connection to the natural world, and their rites and passages which incorporate earthly offerings depict the intrinsic connection this lineage has with the land. Their commitment to healing others, divination and ceremonies centres around honouring the spirits of the apus (the mountains). Because of Villoldo's teachings and traineeships, and others who have learned from the Pacos, many have been able to receive the ancient Inca initiations that

hold Earthkeepership as the path of self-realisation. These seeds belong to the bodily archive in how deep cultural memories are unearthed through the initiations, which are embodied practices in their own right. The Q'eros uphold their belief system based on Ayni, a Quechua term that translates to reciprocity. Ayni fosters the deep relationship one holds with others and the rest of the world, ensuring that there is always a balance between giving and taking. Through this intimate engagement with the world, Ayni can be restored to nature, seeing sacredness in all aspects of daily life.

Finally, protest movements such as those calling for the end of genocide that have risen since the recent events in Palestine, but also seen through Black Lives Matter in 2020, might also be seen through the lenses of ritual and ceremony. A reckoning at a global level led to the coming together of bodies chanting and forming ritualistic bodily movements to create ways of beingness in communion. These acts of resistance and protest are ceremonial acts, which intervene at both a self and system level. The body might cry or yell, and a ripple effect through the interpersonal, political, material and ecological world is ignited. Could protest provide an example of the role ritual and ceremony are called to play during times of reckoning, where collective bodies desire to shape the future? People of all backgrounds gravitate towards physical and spiritual communication and through that coming

IMAGE 3. Futures work in North Eastern Bulgaria. 2023. Credit: Kiril Nachev.



IMAGE 4. Ritual and ceremony for Earthkeepership, 2023. Credit: Amber Zeekaf

together of bodies, chanting, and crafting of signs and symbols that are weaved together resistance through beingness emerges.

AND NOW?

Rituals and ceremonies serve as tools to locate the past, situate the present and shape the future. As we reflect on the practices of embedding futures with ritual, we come to the importance of manoeuvring through liminal spaces. We are on the cusp of unparalleled times, in which the old is dying and the new is emerging. Vaughan-Lee (2023) delves into this unprecedented position in which the unsustainable ways of the world call for radical interventions, and the new world calls for the openness of exploring our kincentric connection with the world. This paradox becomes the invitation to step into our beingness as this article argues, within the rapture and reckoning, and amidst the pain.

“To feel grief, to feel pain, to feel the cry of the Earth—that is an honest, real response. And if the Earth is to be remembered and thought of as a sacred, living being and related to as a sacred, living being, then it asks of us to respond from a real place inside of ourselves.”

- Emmanuel Vaughan-Lee

The aspects of self holds portals for co-creation that can lead to spaces of reciprocity, reverence and beauty. By finding our way back to the cracks of our own beingness, in which we are permitted to unearth our traumas and shadows, and face our individual and collective pain, we can better equip ourselves in self-sufficiency. This makes way for acts that face up to and build resilience towards the ecological crisis (and all subsequent crises) that allow us to be part of transformative actionable outcomes in the Anthropocene. In beingness, we attend to our lives with care and attention, during times of great upheaval and during peaceful times. Lending inspiration from Indigenous ways of living, which are inherently coded in our DNA and where we all derive from, intersectionality as defined by Crenshaw (2017) helps us to understand the tying of past and futures into our present. Beingness, therefore, could be regarded as an act of sitting with the uncertainty that prevails in the Anthropocene, yet allows us to reckon with the magic within, in which new ethics of love allow us to walk the path of Earth- and Wisdomkeepership of our times.

“Sanureehim Aayaatinaa fil aafaaqi wa fee anfusihim hattaa yatabaiyana lahum annahul haqq”

We will show them our signs in the horizons and within themselves until it becomes clear to them that it is the truth.²⁴

Accessible stoma care through distributive design

Project team

Nikolaus Potapow

Organization

Master's Degree Programme
Industrial Design/ Eco-
Innovative Design, FH
JOANNEUM Graz in
cooperation with Convatec

Location

Graz, Austria - Europe

Project type

Product, process, system



PROJECT DESCRIPTION

os*tomy provides accessible, ecologically and economically sustainable stoma care for patients that currently cannot afford commercial colostomy products, and ostomy organisations that can manufacture safe supplies on a local scale with very little equipment for increased independence.

CONTEXT AND HISTORY

A colostomy is an artificial outlet for bodily waste, given to patients ("ostomates") with severe bowel diseases, where stool or output that exits the digestive system is usually collected by a non-sterile plastic adhesive bag.

Voluntary work at a Tanzanian hospital in August 2022 as a medical assistant gave hands-on insights into medical treatments and the handling of equipment in a country with a very low average income and genuinely difficult access to public health care. These personal experiences laid the foundation for this university project on ostomy care supported by specialists from Convatec.

Recognising the issues these patients have in their daily lives, their great dependency on donations, as well as the impact current practices have on the environment, meant a clear call to action to design a multilayer product system specifically for a market that has yet been neglected by the industry.

WHAT IS THE NEED IT TACKLES?

A great lack of independence

With costs of 8 – 12€ per bag and a demand of at least two bags a day, colostomy patients face incredibly high costs for medical supplies they possibly need for the rest of their lives. Hence, many patients in countries without sufficient public health insurance systems are greatly dependent on supportive ostomy organisations. Often run as voluntary associations, they distribute bags received as donations, making them, again, rely on the goodwill of international suppliers or aid funds.

Medical and environmental needs

For many ostomates today, the cheapest way out are diapers or old plastic bags, stuck to their bodies using tape or a piece of cloth, a practice that is likely to cause severe skin irritations or bleedings they must live with on a daily basis.

Yet, neither plastic pouches, nor most professional stoma bags are naturally compostable in any way, leaving behind piles of non-recyclable, hard-to-dispose rubbish especially in regions without publicly run waste collection systems. The os*tomy algae polymer on the other hand proved to degrade over a few months while being watertight when in use.

IMAGE 1. os*tomy's locally produced components in use: the biodegradable stoma bag held in place by a supportive adjustable belt.



WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Systemic innovation

To investigate this intimate field that is usually hidden from the public, research was conducted in the form of simulative self-experiments, study reviews and various interviews with patients, medical professionals, and an African stoma organisation. Empathising with various stakeholders gave practical insights both on a product and systemic layer which eventually led to the concept of distributive design to redefine the value chain involved: Why not provide organisations with a process for self-production from local resources instead of shipping unaffordable supplies around the globe?

Product and material innovation

On a practical level these conclusions meant rethinking the adhesive stoma bag entirely, turning it into a combination of a single-use lightweight bag that catches the output and a long-lasting belt to securely hold it in place. Both components were drastically reduced in complexity to save resources and ease local production as well as the biodegradation process.

To make an informed decision on a suitable material, possible options were assessed with their whole life cycle in mind. This holistic thinking brought up seaweed-based polymers as a resource that does not consume any arable land while having a positive impact on the oceanic climate during growth. It is furthermore widely available along coastlines worldwide which makes it a wonderful raw material for a distributive design approach.

IMAGE 2. Early experiments using shredded seaweed.



IMAGE 3. Creating foil material from agar, glycerol, and water.

IMAGE 4. The first watertight bag prototype, welded with a hot steel stamp.

IMAGE 5. Opening the final bag prototype.

Diving deep into algae-based polymer recipes, many variants with shredded seaweed, sodium alginate and agar were tested until prototypes containing glycerol – derived from plant oil and a by-product of industries like soap production – produced a first foil-like outcome. In a series of experiments, the mixture and processing were refined and cast into moulds that got adjusted sizing according to the measured shrinkage of the material. Meltability was first tested with a soldering iron and eventually performed with a hot steel stamp to prove the possibility of welding foils to a degree where a watertight bag could be produced.

In a similar manner, cloth proved to be a universally available material that requires very little equipment to turn a simple sheet into a fully functioning belt that keeps the stoma bag in place and provides support around the stoma. Within the design process, various mock-ups led to an outcome which is both adjustable and stable, while the developed cutting pattern provides efficiency in the production.

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

ostomy shows a systemic alternative to current practices in medical care under difficult economic circumstances and a new approach to accessibility and affordability by using the concept of distributive design and open-source production.



IMAGE 6. *Placing the bag within the belt opening before placing it onto the stoma*

IMAGE 7. *os*tomy: accessible and sustainable stoma care.*

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

The lacking access to professional ostomy products and know-how is a worldwide issue that os*tomy tries to tackle very practically on a local scale. Knowledge gathered globally – like the centuries old use of agar as a stabiliser in Asian cuisine – is brought together in this project and shared digitally to enable short transport distances of raw materials and turn local resources into safe medical supplies.

WHY IS OS*TOMY DISTRIBUTED DESIGN?

os*tomy is not only a safe and sustainable medical product for colostomy patients, but an accessible set of knowledge and tools that empower communities to help the ones in need.

Local value creation means autonomy and strengthening of local economies, which could even act as a role model for other initiatives, and lead to greater independence for regions or entire sectors. For instance, a raised demand for agar could bring up public initiatives for growing and harvesting red algae which in turn is good for the sea climate and also likely to have the positive side effect of empowering women especially, as currently seen in India.

Putting os*tomy into practice also builds knowledge: as an open-source platform, communities might develop it further, adapt it to patients needs and share their knowledge amongst themselves.

Finally, os*tomy means distributing adequate, more humane help to thousands of ostomates who face medical supply issues every day.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

I would love to have vegan dinner together with any kind of responsibly kept sheep who live a good, species-appropriate life because of their unique role of having multiple positive effects on their environment: they provide wool as a natural resource, keep grass short while also fertilizing and aerating soil for genuinely healthier grassland – and they are beautiful to look at!



Eat me eat me not

An art game for making kin

Project team

Manuela Viezzer

Location

Wassenaar, The Netherlands
- Europe

Project type

Persuasive art game

PROJECT DESCRIPTION

Eat Me Eat Me Not is a persuasive art game exploring themes of intensive farming, animal exploitation and veganism. Among other things, it uses Promise cards as a design feature to enhance the impact of sustainability games on player behaviour. It is also part of a larger artistic research project which investigates how to design and use art games that can help humans make kin with the nonhuman others with whom we share Earth.

CONTEXT AND HISTORY

A precursor of Eat Me Eat Me Not is a game called Promise Me [image 1], which I developed as part of my final project for the Master of Fine Arts at the Hogeschool voor de kunsten in Utrecht, NL.¹ In Promise Me players can use special cards to make promises about future behaviours, thus creating a direct link between the play world and the real world and giving Promise Me the characteristics of a persuasive game.² As such, it has been used as a test case to investigate how to increase players' responsibility towards a game topic, in collaboration with TUDelft game researcher Annebeth Erdbrink. Since the results of these investigations have been promising³, I decided to continue exploring the combination of art and gaming techniques to engage players with meaningful experiences that may broaden their perspective, raise awareness and eventually lead to behavioural change.

The initial conception and design of Eat Me Eat Me Not started with my residency with the School of Commons (2021-2022) and its development is part of a larger artistic research project which investigates how to design persuasive art games that can be used to help humans make kin with the nonhuman others with whom we share Earth.

WHAT IS THE NEED IT TACKLES?

The notion of 'making kin'⁴ implies both inclusivity and selectivity, in an effort to build a multispecies community in which all the actors are able and willing to work together and to be collectively responsible for each other. 'Making kin' encourages thinking beyond species-specific and is a reminder that all earthlings are kin, in the deepest sense. It rests on the concept of sym-poiesis, which means



IMAGE 1. Promise Me game session (ceramics and paper, dimensions variable. 38CC, Delft, September 2021. Photo Credits: Manuela Viezzer)



IMAGE 2. Eat Me Eat Me Not prototype setup (ceramics and paper, dimensions variable. Wassenaar, December 2023. Photo credits: Liliana Hedouin)

making together or co-creating (as opposed to auto-poiesis or self-making.) It requires new ways of working together in order to foster collective responsibility (what Haraway calls response-ability, the ability to respond, and hence to listen first of all.) It requires 'staying with the trouble' which means acknowledging the possibility of failure. It is also an urge to think, to think of new ideas and new stories because the ones we relied on so far are failing us. How can we learn kinship and how can we put it into practice? It is not easy, but I believe it is possible, one game at a time.

Games can be powerful tools to involve players and inspire them to think in novel ways. They can also be designed with purposes other than entertainment, for example with the aim to raise people's awareness around certain topics and to encourage making certain desired choices in the real world. Such games are called 'persuasive' and are designed explicitly to change the attitude and behaviour of players beyond the game session. When designing Eat Me Eat Me Not [IMAGE 2], my initial assumption was that the ability to 'make kin' requires both 'perspective-shifting' (being willing to listen to other earthly beings) and 'alter-rooting' (being willing to engage with values that are different from our species-specific own). Besides allowing for mechanism that enable players to change roles, these abilities have been implemented through the use of Story cards: by using stories to reveal hidden aspects of the food industry, such as externalised costs, or by educating people about the actual life of animals in industrial farms, the cognitive abilities of animals and their sentience, or the impact of food choices on the environment, the game aims to foster informed decision-making about food choices and deeper engagement with animals.

The engagement with the animals' perspective makes Eat Me Eat Me Not not only about animal rights and welfare, but truly about kinship: kinship implies recognizing the other as a true subject, as an individual with its own unique traits and worth of living according to its own nature, worth per se and in se, and not as a mean for profit; a subject worthy and valuable, whose life matters.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Eat Me Eat Me Not was developed with the aim to influence players, make them think about what is really going on when animals are exploited within intensive farming, and eventually stir their behaviour towards veganism.

Eat Me Eat Me Not is a physical game, in which players share a space of interaction and are prompted towards real communication. It reuses and expands some design concepts already present in Promise Me: a role selection mechanism requiring players to embody different roles and taking different, and sometimes conflicting, points of view; the fact that the game does not have any initially established winning or losing end points, in such a way that the aim of the game and the playing rules can change and are initially agreed upon among the players; and the use of commissive speech acts as elements of the game, so that players are invited to take responsibility for bringing about certain future states of affairs. Given the artistic setting, however, the act of committing remains ambiguous (it can be real, but it can also be pretended, done only for the sake of the game) thus opening up for the player the possibility to investigate imaginary paths of action that might conflict with their background ideas and prejudices.

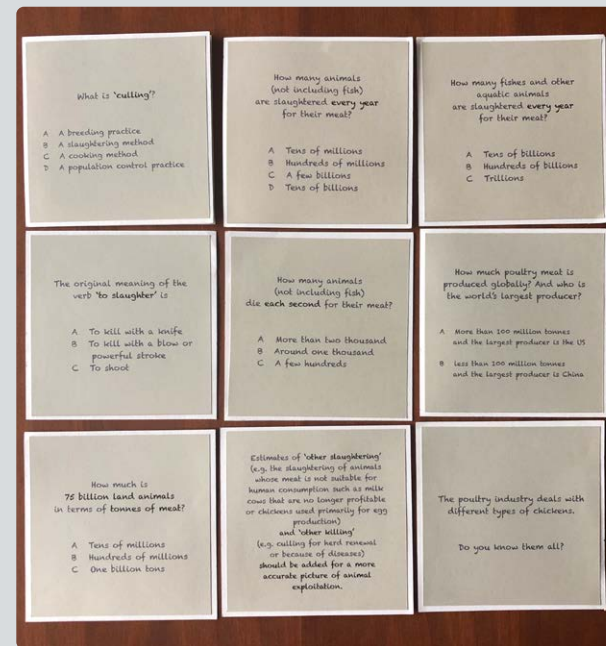
WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

At the time of writing, a first prototype for Eat Me Eat Me Not has been realised and is currently under testing because the results achieved with its predecessor, Promise Me, were encouraging. In particular, it is worth mentioning the findings concerning the relation between promises as a game element and the players' sense of responsibility towards a vegan diet: a significant change was found in the player's score, measured before and after the game. Since the change related to these two items could be interpreted as 'awareness of and concern for the impact of your behaviour on others', it was concluded that playing the game really encourages players to become aware of their behaviour and also to become aware of the consequences of their behaviour not only for themselves but also for others, both humans and nonhumans.

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

Making kin is a global practice rooted in localised practices. At the global level, making kin is about being in harmony within a balanced ecosystem. A balanced ecosystem is a global notion, and should be understood as an inclusive multispecies community where actors recognize that living and dying are at stake together, and at the same time strive for kinship, for inclusivity. Building a balanced ecosystem requires the integration of more localised practices such as: listening, confronting and engaging with alternative value systems, working together, and being responsible for each other.

Persuasive art games can act as cultural bridges, fostering understanding of local practices and encouraging players to consider diverse perspectives. By engaging players in informed decision-making within the game's context, these experiences may contribute to a broader awareness and convergence of ideas, promoting a more globalised understanding of various practices.



WHY IS EAT ME EAT ME NOT DISTRIBUTED DESIGN?

The notion of distributed design applies to Eat Me Eat Me Not at different levels. At the level of the game mechanics, players are invited to team up to resist the system of factory farming when playing in the Resistance area: teamwork and collaboration towards the achievement of a common goal is thus promoted, and also the management of shared resources (because different types of cards can be accumulated and then used when it is most profitable) [IMAGE 3]. At the level of the interaction among players, the advocacy character of the game naturally leads the players to communicate and discuss among them the impacts of factory farming on the animals, on the environment and also on health; this is particularly encouraged by the questions and the stories represented in the Story Path cards [IMAGE 4]. At the level of the game conception and development, Eat Me Eat Me Not has benefitted both from the feedback provided during the use of its predecessor, Promise Me, as a research test case (from players, but also from other game researchers and game designers) and from the knowledge and insights gathered during my residency with the School of Commons.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Every year 70 to 80 billion land animals and between 1 to 3 trillion aquatic animals are killed to produce food. Besides the fact that the vastity of such exploitation does not even serve the purpose of eliminating famine, hunger and malnutrition, it is clear on the contrary that it represents a huge obstacle to the emergence of true kinship between humans and nonhumans.

Often René Descartes is singled out as the philosopher who set the conceptual ground for the exploitation of animals by equating them to automata unable to think and to feel. I would like to have dinner with him and, after discussing with him the most recent scientific evidence of animal consciousness, I would send him back to his time with the hope that he would revise his theory. And then I would keep my fingers crossed waiting for the time ripple to reach our present day.

IMAGE 3. Eat Me Eat Me Not detail of animal figurines (ceramics and paper, dimensions variable. Wassenaar, December 2023. Photo credits: Liliana Hedouin)

IMAGE 4. Eat Me Eat Me Not detail of Story Path cards (paper, dimensions variable. Wassenaar, December 2023. Photo credits: Liliana Hedouin)

Intercommunal Collaborations

A critical design facilitating the shift towards the pluriverse

Project team

Zeynep Uğur

Organisation

Onion Works

Location

Amsterdam, Netherlands -
Europe

Project type

Tool, Workshop

PROJECT DESCRIPTION

Intercommunal Collaborations (IC) is a critical design that challenges the Eurocentric processes and colonial mindsets ingrained in the international development sector and our broader society. It facilitates reflection on the dominant capitalist values and modern assumptions (such as individualism, competitiveness, dualistic thinking, a belief in control over nature, etc.) by introducing alternatives.

The project brings forward the ideas of 15 co-creators across 10 countries and is built upon the concept of the pluriverse, which provides a counternarrative to contemporary Northern assumptions of the universal.

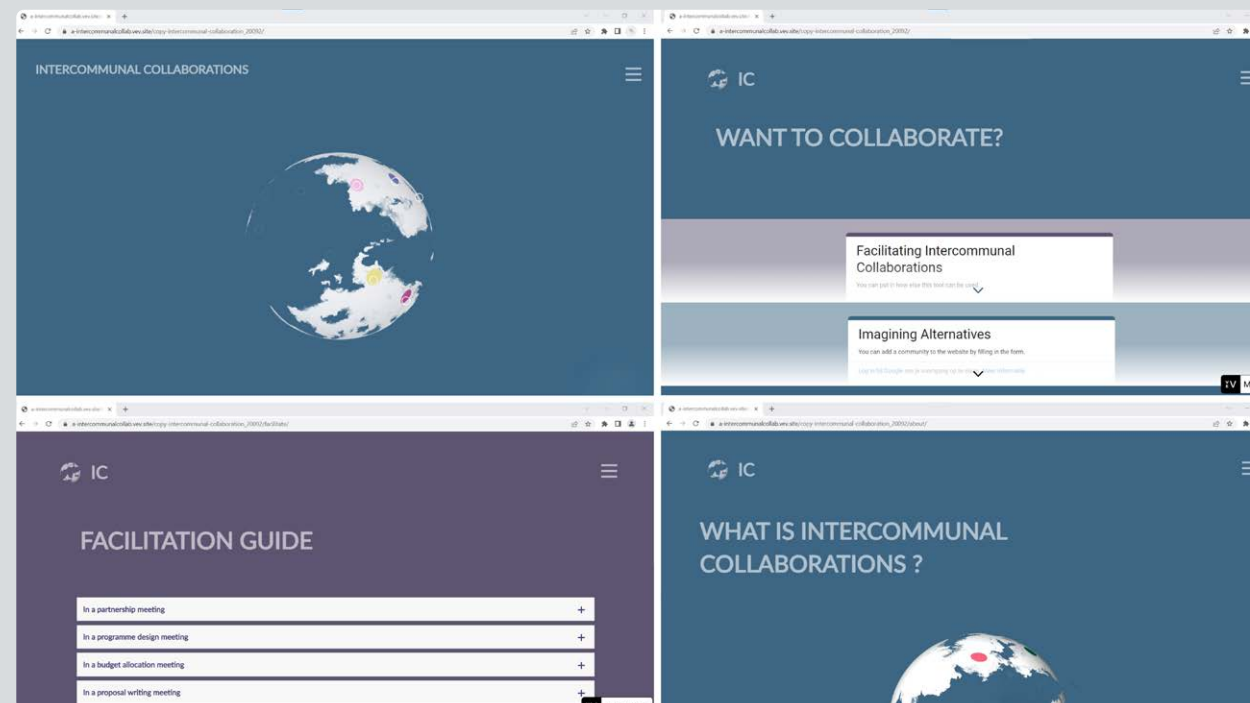
As an interactive platform, IC encompasses a fictional globe through which a set of communities are introduced. Rooted in "Pluriverse: A Post-Development Dictionary"¹, these communities employ storytelling to unveil fresh perspectives on common practices like accountability management, and impact measurement. The collaborative section extends an invitation, encouraging people to participate in envisioning alternatives.

The Intercommunal Collaborations workshop, facilitated through the platform, provocatively poses the question: "What if multiple worldviews coexist?" This query becomes the driving force behind challenging participants to operate from different value systems. Expanding far beyond the development sector, the workshop provides an experimental space for the redesign of business plans, curriculums, technological devices, and more, all through the lens of the introduced value systems. In doing so, it prompts a transformative shift in participants' mindsets towards embracing pluriversality.

CONTEXT AND HISTORY

There is widespread consensus that in partnerships for development, too much power is in the hands of donors and international NGOs, while partners in the South lack agency.²

Born from socio-political history, this power imbalance roots back centuries, making it a complex issue that requires abstract thinking and creativity to battle against.



To leverage systemic change, Intercommunal Collaborations targets mindsets and beliefs that constitute this problem. Analysing and visualizing paradigms, it finds place in the development sector as a transformative initiative towards a world where many worldviews co-exist.

Born as a disruptive design in the international development sector, IC acknowledges that Eurocentric values and modern assumptions influence every aspect of our hyper-capitalist society. Therefore, the project expands to diverse sectors, providing workshops in education, business, design, and technology. Introducing new perspectives and fostering alternatives, IC takes a comprehensive approach in shifting towards the pluriverse.

WHAT IS THE NEED IT TACKLES?

Speculative design thrives on imagination and opens new perspectives on complex problems, "to create spaces for discussion and debate about alternative ways of being, they act as a catalyst for collectively redefining our relationship to reality;"³ This endeavour becomes particularly important in a world grappling with intricate challenges that defy straightforward solutions, demanding innovative and reflective approaches across the spectrum of professional domains.

However, as one of my co-creators put it, "international development is built upon and functioning in a capitalist economy," just as education, technology, and creative sectors. Despite the acknowledgement of the societal crises, people have scarce time, mind space, and budget to reflect and find alternatives within their professional and social roles.

Combining design thinking with philosophy and applying it through technology, Intercommunal Collaborations takes an innovative approach to this challenge. Bringing speculative theory into a tangible practice, offering alternative visions without predefined solutions, and facilitating reflection, it serves as a catalyst for creative alternatives.

IMAGE 1. Intercommunal Collaborations Platform

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Paradigm & System Design

“Systemic change captures the idea of addressing the causes, rather than the symptoms, of a societal issue.”⁴ To understand the causes, I embraced the complexity of the challenge and the interlaced dynamics that constitute it. My first step was to zoom out and explore the long-term history, the current state, and the future aspirations of the development sector. Conceptualizing and visualizing my findings, I sketched out the paradigm change I aim to create.

Later, gradually zooming in on the details and structures of the sector, I visualized the different layers of operation, the stakeholders, and the flow of power into a system map. This enabled me to identify leverage points where design can intervene and create the most impact toward transformation.

Unpacking Power

My initial aim of fostering balanced power dynamics faced a fundamental challenge—the elusive definition of a “power balanced” state in a dynamic, subjective context. The conceptualization prototype, power board, symbolically features interconnected spheres representing major actors in the development sector. Standing on a hemisphere, the dynamic flow of water between these spheres signifies the fluid nature of power. The tangible metaphor reveals the impossibility of a permanent balance and exposes systemic biases and Eurocentric values as blocks inhibiting the free flow of power. This conceptualization shifted the design goal towards fostering “power fluidity,” removing the mental blocks by creating space for diverse knowledge and value systems.

Co-creating Alternatives

A design fiction artifact communicates the “values, beliefs, ethics, dreams, hopes, and fears of another world”³. As a designer, conscious of my positionality, I engaged participants to collectively shape this envisioned realm. My process was guided by the perspectives and commentaries of 15 development professionals from 10 countries. Recognizing the challenge of discussing sensitive topics like Eurocentrism and colonialism, I abandoned the assumed ideal of neutrality, fostering transparent two-way dialogues. As a designer, my self-awareness was paramount, reflections after each conversation informed my evolving design process, emphasizing the elimination of personal assumptions and leading to a more inclusive design process.

Communities of IC

In crafting the fictional community pages, I derived values and practices from the 68 worldviews introduced in *Pluriverse: A Post-Development Dictionary*. Navigating the challenge of understanding these diverse philosophies, I utilized AI to generate 10 fictional communities based on the strategic grouping of the provided worldviews. Iterative refinement

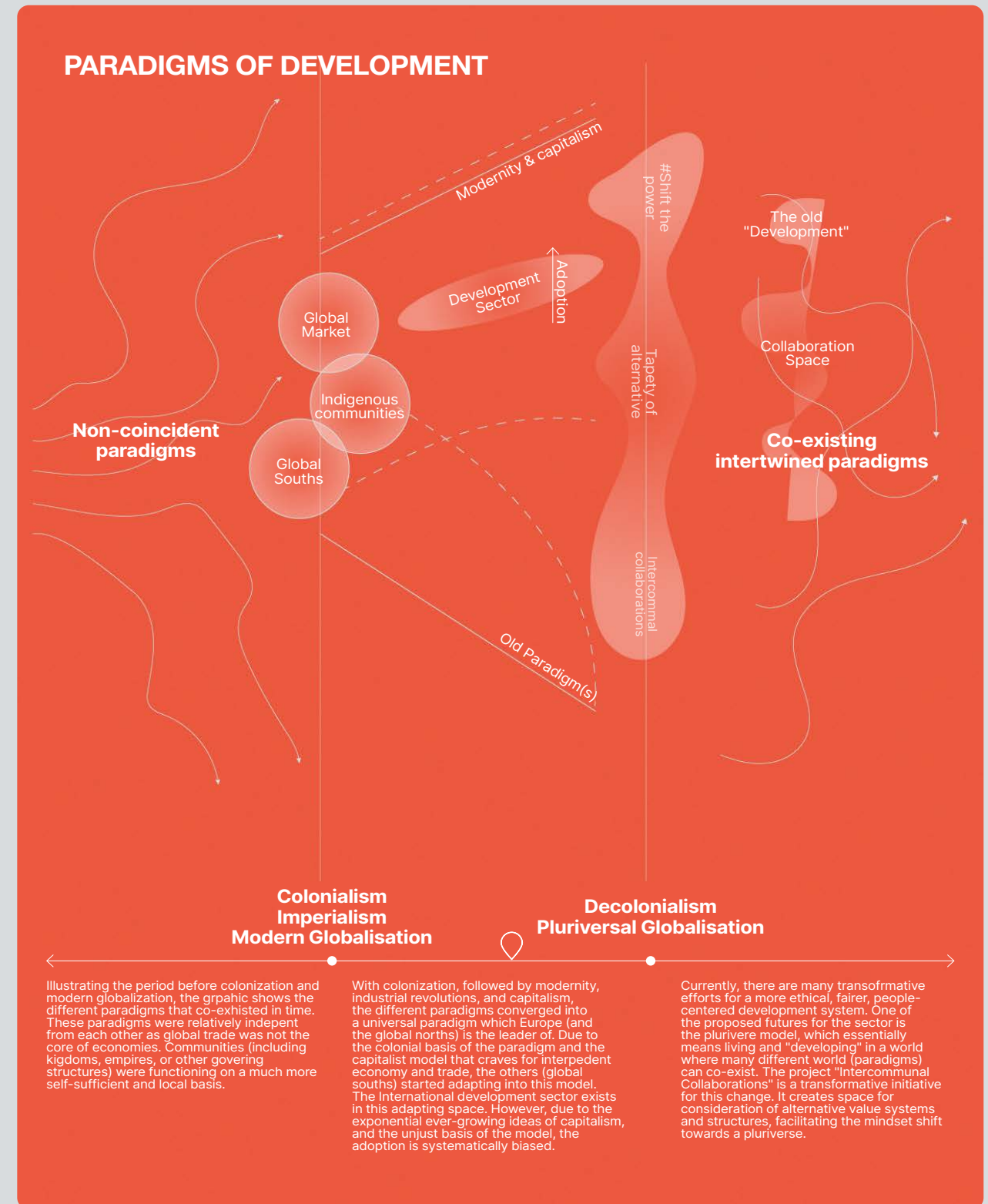
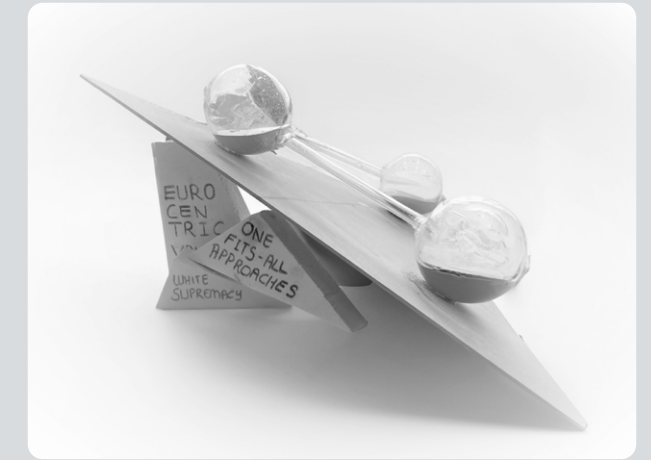
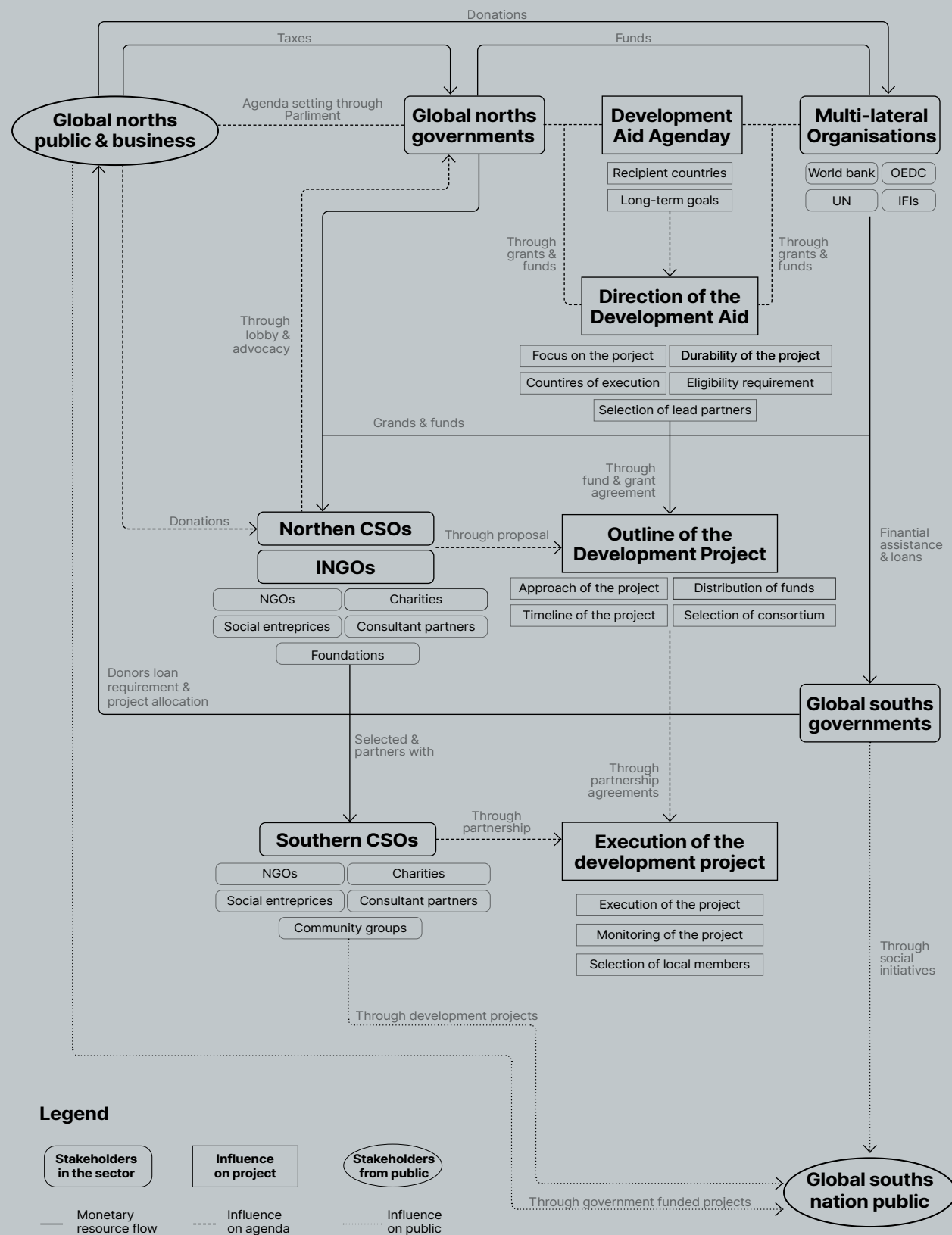


IMAGE 2. Paradigms of International Development

involved adding storytelling elements and intriguing visuals. While AI lacks the human perspective, this approach established an effective base for the platform. The collaborative potential was highlighted for real communities to further add to the tapestry of alternatives.

SYSTEM OF DEVELOPMENT



Place



WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

Customizing the workshop for each context, IC brings plurality and reflection into the current norms of development, policymaking, education, design, and technology. Introducing value-centric thinking through low threshold activities, and working with case studies, the participants re-design their processes and products for a different worldview.

Depending on the context, the case studies range from the double diamond framework to a business plan, or from the microwave to a mobile application. The results function as low-fidelity design fictions, enabling the participants to imagine their roles in an alternate reality; and the possibilities that come with it.

Breaking the bubble of our current norms, the exercise provides the space for participants to reflect upon their own values and assumptions. The awareness of an alternative further influences their professional and social roles; creating a lasting effect and catalysing social transformation towards the pluriverse.

Additionally, Intercommunal Collaborations carries the capacity to build communities around shared values and offers a reflective space, empowering participants to work in solidarity towards their desired worldviews. In the long-term, this leads to a more sustainable and ethical approach across different professional and social realms.

IMAGE 3. System map: Understanding the International Development Sector

IMAGE 4. Self-Reflection after Interviews (March 2023, Eindhoven, Zeynep Ugur)

IMAGE 5. Power Board: Exploring Power Fluidity (April 2023, Eindhoven, Zeynep Ugur)

IMAGE 6. Communities of IC



WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

IC is inherently rooted in the local context, providing space for a bottom-up worldviews to spark global change. The platform's collaborative nature and the workshop's adaptability allows it to resonate with diverse local realities, ensuring relevance and impact at the community level. While the project's implementation and design take a local stance, the underlying theory and the envisioned transformative change aspire to transcend geographical boundaries, resonating globally. This dynamic interplay between the local and global elements is integral to the project's ethos, acknowledging the importance of localized strategies for fostering a broader, global shift in paradigms.

WHY IS INTERCOMMUNAL COLLABORATIONS DISTRIBUTED DESIGN?

Intercommunal Collaborations embraces a distributed design approach through its co-creation process and community-based strategy. The platform's collaborative nature encourages global participation, fostering an ever-expanding digital ecosystem. The open-source platform ensures transparency, while the facilitation guide empowers users for independent adaptation. With a focus on inclusivity and cultural sensitivity, Intercommunal Collaborations navigates the complexities of social and environmental systems. This approach aligns seamlessly with distributed design principles, emphasizing adaptability, community engagement, and the interconnectedness of diverse elements.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMAN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Jacque Fresco, I have some projects in mind to discuss with him...

IMAGE 7. IC Workshop Re-Designs (2023, Netherlands, Zeynep Ugur)



15 CO-CREATORS IN 10 COUNTRIES

"I asked (the ministry) if they were considering switching to a decolonial process and they looked at me as if I asked do you want sh*t for dinner? She said "but we have very rigid structures"

"We were colonized, so there is a lot of internalization of these Eurocentric values"

"The development sector is only necessary because of colonisation"

"We need to start accepting and warranting value to things that are not familiar to us"



"We need an inefficient communal approach"

"Development is a business of hope. Hope doesn't have a timeline!"

"Put the communities at the center of development"

"The development sector is built upon and functioning in a capitalist economy"

"Put the communities at the center of development"

"The current inclusion is superficial, it's saying: Let me teach you my way, then I can include you"



IMAGE 8. IC Workshop (2023, Netherlands, Zeynep Ugur)

IMAGE 9. Co-creators of IC

QR CODE. Explore the Intercommunal Collaborations' platform

Disperse the Spectrum / Disperse the Spectres*

Our artistic practice on AI

By Roc Albalat, Pau Artigas, Marc Padró, Marcel Pié and Daniel Pitarch from Estampa

In Autumn 2023 we spoke at Marató DHUB, the opening event of the season at Disseny Hub, Barcelona's Design Museum. All participants were asked to bring an object and use it to talk about current debates and their own practice. The different objects formed a temporary collection, a kind of humble cabinet of curiosities for the present. What follows is the text we read at the event.

can't understand it yet'. This is a very unhelpful discourse because it does little more than take it out of our hands. To push it away and hide it. It is obvious that AI is not a product of the future, but a development of our present context. It is part of dynamics and logics like extractivism and ecological crisis that we are aware of and try to change. The bad futurist discourse erases the context, leaving only the object; on the other hand, the attentive gaze that interests us should serve as a map for the present.

A LENS

The object we have chosen for this collection is a lens. It is a simple and seemingly ordinary object that can be described in different ways: by its material -optical glass-, its thickness -5 mm- or its focal length -50 mm-. But today we are particularly interested in using it to think about other things; we want to see the lens as a kind of miniature model of technology. This 'thinking with', using one thing to talk about another, is a way of doing things that interests us; we use the logic of collage or appropriation in our work. If on the one hand we have the lens, on the other hand we have some current technologies. In particular, machine learning, the main current approach in artificial intelligence, which has been one of our lines of work since 2017. We have been interested in the study of the uses and ideologies of AI. We ask ourselves how it works and what to do with its applications, such as computer vision tools.

The lens is also interesting to us because we see a historical dimension in it. Lenses are at the foundation of our visual culture. We can say that it was with them that the automation of the production of images of the world began. The recourse to relations with the past, which can be those of historical series or of intuitive leaps, is particularly important when working with technological novelties. Establishing continuities is a strategy for understanding and counterbalancing certain discourses. Technologies like AI are often characterised, and we parody a discourse, but less so than it seems, as 'coming from the future'. The subtext of that characterisation would be that 'we

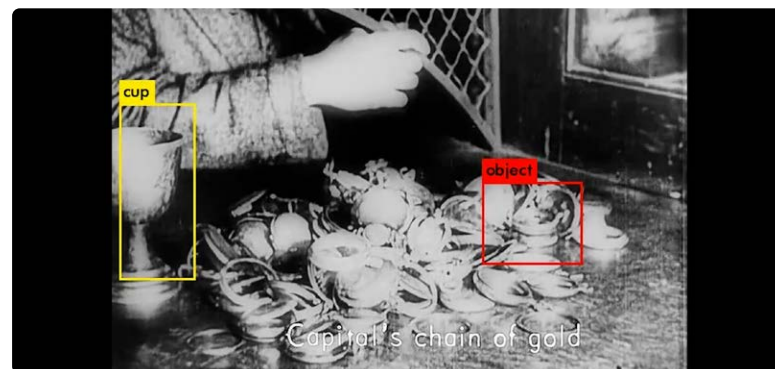
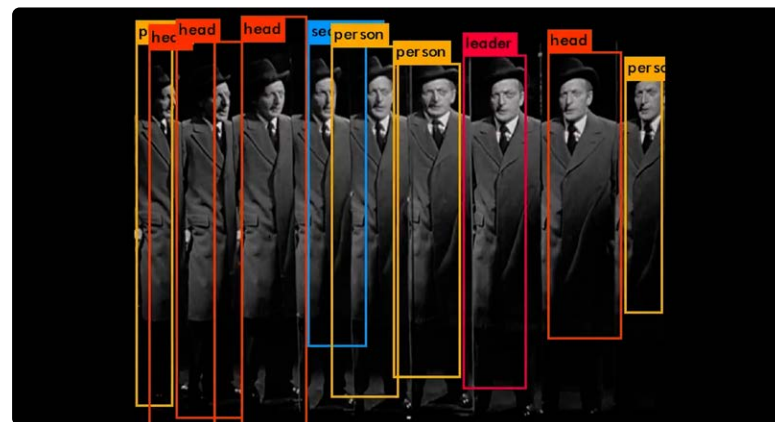
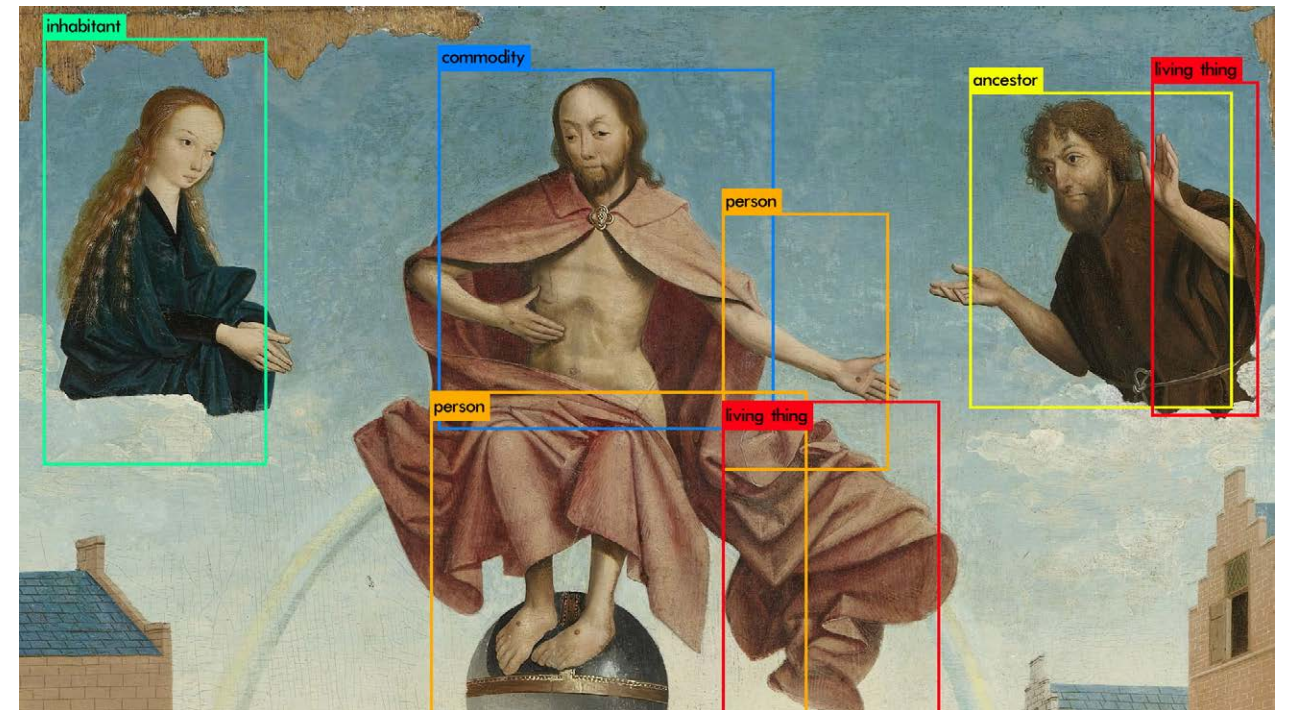


IMAGE 1. Film still from ¿Qué es lo que ves, YOLO9000? [What do you see, YOLO9000?], (2019, Estampa)

IMAGE 2. Film still from ¿Qué es lo que ves, YOLO9000? [What do you see, YOLO9000?], (2019, Estampa)



COMPULSIVE ANALOGIES

The first use someone would make of the lens we brought is to magnify. It is a biconvex lens in which light is refracted, producing an enlargement of what we see. It is therefore an object of attentive observation, of approaching the details of things, of not being satisfied with a first glance, but of shaping and concentrating vision. These are all actions that must be taken with any new technology: not only to use it or to look through it, but also to scrutinise the technology itself.

An important element in the use of the lens is the concentration of the gaze on a single part, the framing. To that, magnification adds a further separation, a change of scale. Both elements, scaling and framing, can be a first step to start a machine of analogies. When we have worked with computer vision tools, we particularly like mislabellings.

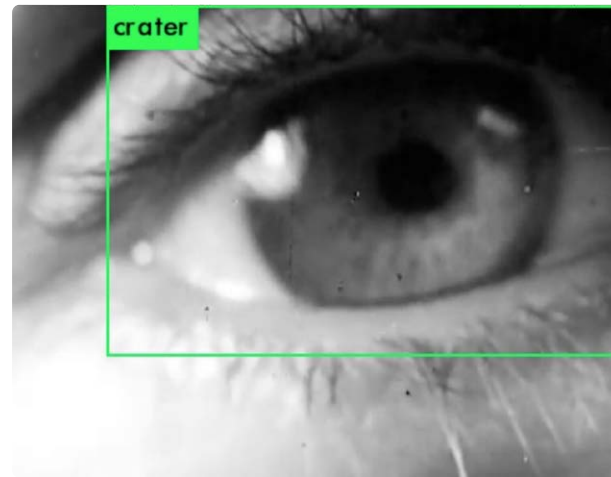
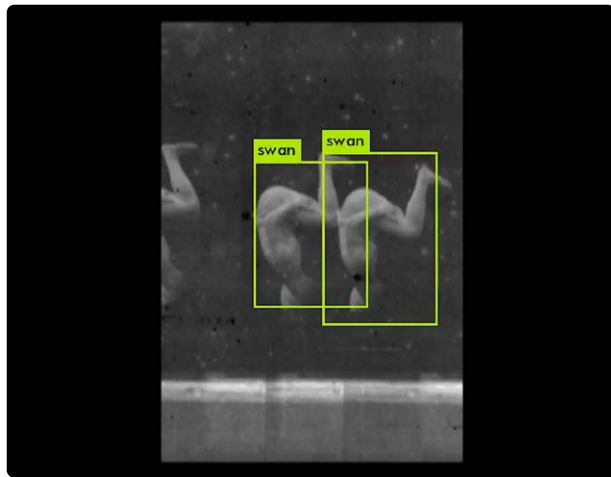
They interest us because we choose to treat them not as an error but as a proposition. From the point of view of the tool developer, these mislabels would be considered negligible (they are part of the error rate), but our approach wants them to be central. In doing so, we put the tool on a different axis; we do not value it as an element that must close off the meaning of what it sees, but as one that can open it up. This

IMAGE 3. Film still from ¿Qué es lo que ves, YOLO9000? [What do you see, YOLO9000?], (2019, Estampa)

operation seems to us to be a way of discussing the original context of production. In the face of the drive for mass labelling, for the constant description and annotation of every image that enters a digital circuit, rescuing errors and seeing them as possibilities is a way -a humble way, but a way - of questioning normative approaches. It is an operation of using the tool against the grain. Of not wanting to leave the context aside, the 'for what' as a given element, but to look at it and discuss it.

When we first started working with these technologies, we got our hands on a software for facial recognition and emotion analysis. To test it, we fed it all sorts of videos, including a famous scene from Taxi Driver (1976) where the character talks to himself in the mirror while holding a gun, as if in a violent confrontation with a stranger. The software was able to identify the actor's face in most of the frames. This was an amazing ability that is now taken for granted and has many applications. Precisely because some of these applications are frightening, those related to surveillance and the desire for constant monitoring, we looked at the moments when it did not work as expected. The most interesting identification returned by the software was not that of the face of the actor, but that of a face on the gun he was holding.

This identification, taken as a proposition rather than an error, explains well what happens in the scene; one could say that the words and the attitude of the character are not only his own, but also a product of



the weapon. His voice is also the voice of the gun speaking through him. In this sense, the weapon is not inanimate, but has agency and a psyche that infects the character.

This identification of a face in the gun - better still, in the reflection of the mirror in which the character sees himself armed - comes from the compulsive nature of these tools. Contrary to certain discourses on AI, which speak of it almost as a conscious entity, what machine learning tools do is automate concrete and specific tasks (and in many cases it is surprising that these tasks can be automated). If this tool can only see faces, it is our duty to provide it with images in which there are no faces. To contradict the programme, to go against the design in the use, is an interesting strategy. And if it seems appropriate to say that it is the voice of the gun that we hear in this film scene, expressing its violent psyche, we can also ask ourselves what kind of personality each new technology imposed on us brings with it.



IMAGE 4 & 5. Film still from *¿Qué es lo que ves, YOLO9000?* [What do you see, YOLO9000?] (2019, Estampa)

IMAGE 6. Tests for Rostro y código [Face and code] (2016, Estampa)

IMAGE 7. Camera obscura engraving. Unknown author

IMAGE 8. "An Instrument of Use to take the Draught, or Picture of any Thing" (Robert Hooke, 1694)

IMAGES OF THE WORLD AND IDEOLOGICAL INVERSIONS

Returning to the lens, another possible use is to form an image. This is the phenomenon of the camera obscura, the first device for the automatic production of images of the world.

This is an instrument on which current debates can have an echo. When the camera obscura was used as a tool for drawing [IMAGE 8], there could already be a discussion about the agencies and authorship of the resulting image. What is the role of technology and what is the role of the person, if we think of them separately? What value do we attach to the images produced in this way?

The camera obscura is the first of all cameras, and as such reaches all the way to recent fields such as computer vision. Because computer vision does not look at the world, it looks at images of the world. It is a new piece that fits into the tradition of the camera and is therefore part of this braid of technologies. New technologies are not just new, we need to use everything we already know about them, we need to connect them to their many lineages.

As we have said, it is not only the object itself that can interest us, but also how it is talked about, how it is used in discourse. One of the most metaphorical uses of the camera obscura was the comparison made by Marx and Engels to characterise ideology.¹ They looked at the inverted image produced by the camera obscura to explain that ideology produces a similar mediation. Ideology constructs an apparent image of the world which we judge to be realistic, but in which reality may be upside down, distorted at its foundations.

There are many ideological inversions when talking about AI. The discourse of the future, previously mentioned, is one of them. AI is being developed today and we have many tools to understand our world. The recent growth of AI goes hand in hand with what we can call 'big data ideology': the desire for accumulation and surveillance that underpins the Internet. In this way, large proprietary AI models can be described as a privatisation of the commons, because they take data from the public space of the Internet and process it with industrial and private infrastructure. And certainly, and unfortunately, the privatisation of the commons is not coming from the future. To shroud AI in secrecy is to mystify it, to

IMAGE 9. Chromatic aberration. Film still from an unfinished project (Estampa)

prevent us from seeing it, from understanding how it participates in forces that are already at play, how it is yet another twist in the logic of our society. Other ideological reversals of the digital world - because AI is, after all, its equivalent - are the concealment of human labour and of the physical infrastructures on which it depends.



DISPERSE THE SPECTRA

If we pick up the lens again and look carefully through it, an interesting phenomenon is the small coloured stripes that appear on the contours of things. In this case, a faint blue streak.

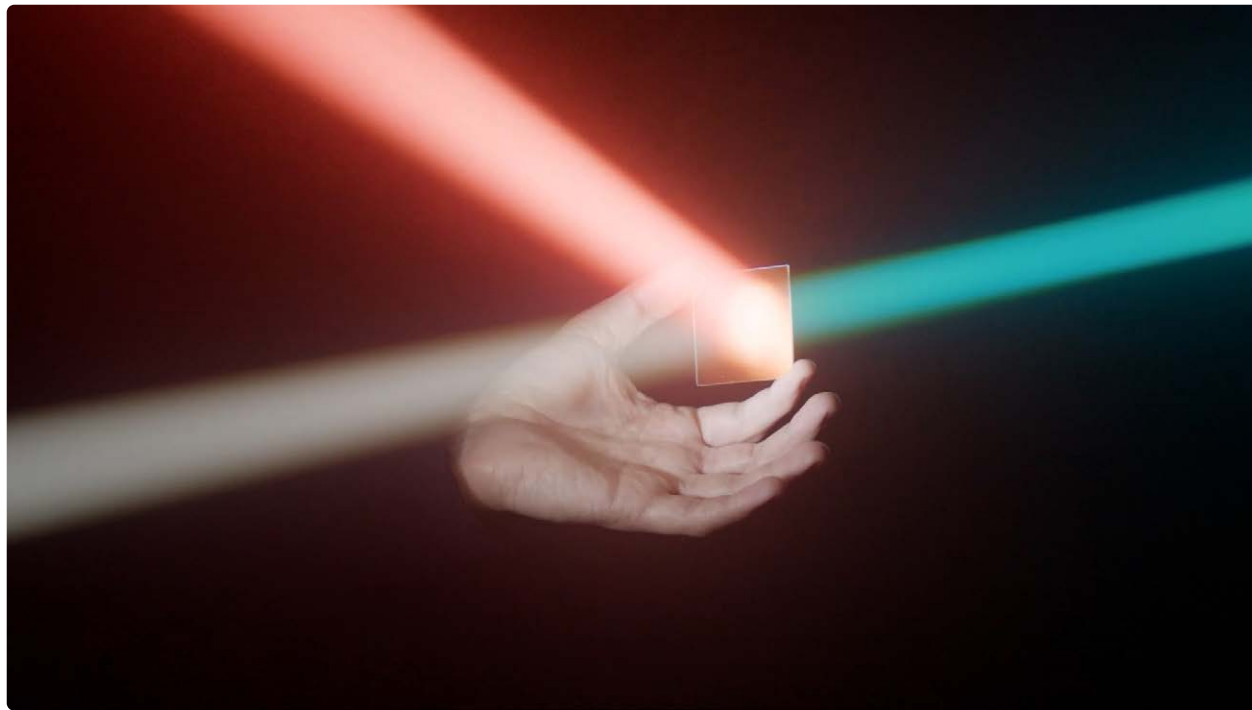
This is called chromatic aberration. The refractive index of a material depends on the wavelength. This means that the colours that make up the visible spectrum refract at slightly different angles. So what we see in the contours is the scattered visible spectrum.

This light scattering can be observed much more clearly with other materials that only reflect certain wavelengths.

What we are doing with this little piece of glass is something that we think is important to do with any technology. Scattering the spectrum, forcing aberration, are ways of separating the components. We want to disperse the spectrum, not the chromatic one, but the digital spectrum that we live in.

Today, when every image is parasitised by artificial vision, it is important not to take it for granted that machines can see, but to look at the way they operate, tool by tool.

What does each new development do? How does it filter what it sees? What does it look for in the images of the world? What does it project onto the world that it seems to only observe?



Spreading the machine learning spectrum also means searching for the training datasets.

A trained network is a reflection of its dataset. The interaction between the two is what needs to be observed and questioned. We have to ask ourselves: Why this output after this prompt?

Generative tools give us back an image of what we show them, they are a kind of deformation ('statistical renderings', as Hito Steyerl calls it).² As such, as a distorted return, they can be interesting if we understand them as an analysis of training datasets. From this point of view, the big models that are being developed - from ChatGPT to MidJourney - would be a kind of parody of our society. The models we can train on specific datasets are parodies of particular imaginaries. This one, for example, undoes the pornographic image, returning a kind of counter-image.

If, as we were told, pornography was the main content of the Internet, this piece -NSFW- is a kind of statistical portrait of the Net.

After we made this film, when we tried to share a fragment of it on social networks, a warning popped up, labelling the images as "sensitive content". Where we see abstraction and a slight connotation, an automated process clearly saw explicit content. We highlight this example because it explains another characteristic of the digital present: machine-machine loops, all those processes that elude human presence and that also need to be dispersed to be made visible.

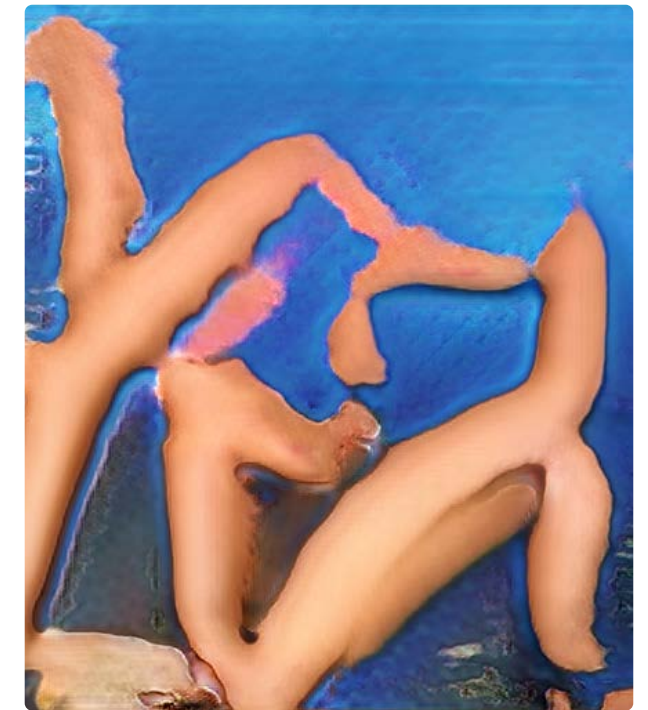
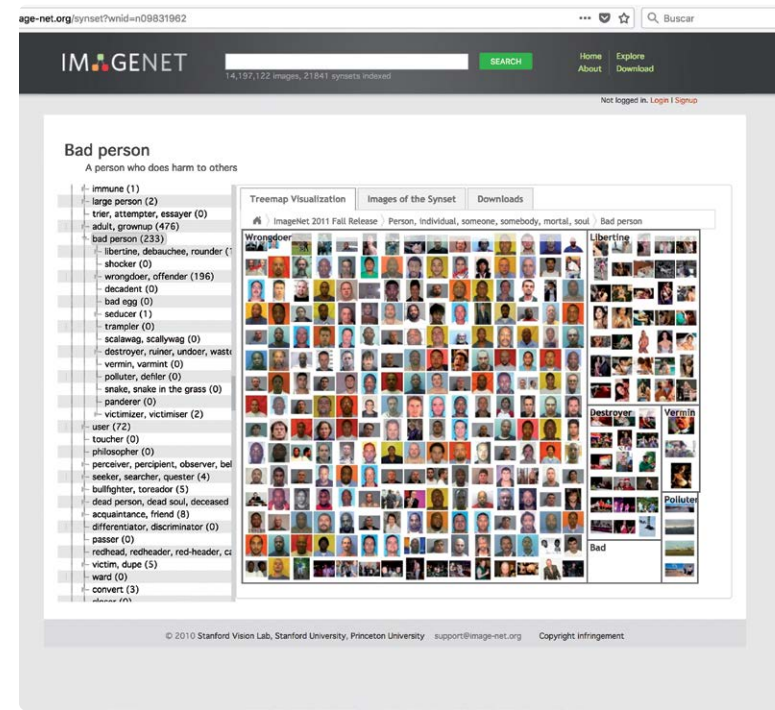


BEYOND TRANSPARENCY

Finally, another characteristic of the lens, and indeed of any transparent material, is that it not only lets light through, but also reflects it. Light bounces back, allowing us not only to see through it, but also to see what is in front of it. Even in cases where the reflection is cancelled, as in the case of museum glass, it is still reflective from certain angles. Like these glasses, the design of digital tools often strives for transparency while obscuring the reflections. When this is the case, it is necessary to force them when using the tools. Digital technologies, and even more so AI, reflect the society in which they are developed, its values and

IMAGE 10. *Interferències en làmines fines* [Thin film interference], work in progress (Estampa)

IMAGE 11. *Imágenes huéspedes* [Host images], multi-channel audiovisual installation (2022, Estampa)



imaginaries. Avoiding transparency and making tools opaque must be a strategy for thinking about them. We need to work against false transparency and false evidence.

In this case we see a computer vision tool that labels the content of images.

Each label has a so-called confidence percentage. For example, if it applies the label 'person', it does so with a percentage that expresses the confidence in the assignment of that label. For normal use of the tool, a standard confidence threshold is required. In processing this scene for our video-essay *What Do You See, YOLO9000?*, we gradually lowered the threshold to the minimum to get the tool to say more and more. The more we make the tools talk, the more we know about them, the more they reveal themselves. It is almost a psychological strategy, forcing lapsus linguae and turning the tool towards itself.

At the same time, this image we see, this world full of labels, seems to us to be a good reflection of our condition. We live in a world where everything has to be recorded, where the devices that monitor us multiply, where the air seems to get thicker and thicker. Dispersing the spectrum should also be a way of seeing anew. A strategy to get moving.

* The original text is in Catalan. As in most Romance languages, there is only one word for both "spectrum" and "spectre". The original title plays on this polysemy.



IMAGE 12. *ImageNet* webpage, screenshot, 25/05/2018 - *El mal alumne. Pedagogia crítica per a intel·ligències artificials* [The Bad Pupil. Critical pedagogy for artificial intelligences] (2017-2018, Estampa)

IMAGE 13. *Film still from NSFW* (2018, Estampa)

IMAGE 14. *Film still from ¿Qué es lo que ves, YOLO9000?* [What do you see, YOLO9000?] (2019, Estampa)

Feminist Hardware: Making Printed Circuit Boards with Natural Clay

Ethical hardware

By Patricia J. Reis and Stefanie Wuschitz from the Academy of Fine Arts Vienna and Mz* Baltazar's Laboratory

HAVE YOU HEARD OF FAIR TRADE COFFEE AND BANANAS?

Aha. And what about fair trade hardware?

It is an open secret that the hardware in our smart devices contains not only plastics but also conflict minerals such as tungsten, tin, tantalum, silver and gold. Most devices are used only for a relatively short period before they turn into contaminating e-waste.¹ We are investigating alternative hardware from locally sourced materials, so-called ethical hardware, to develop and speculate upon renewable practices for the benefit of both nature and humans.

ARTS-BASED RESEARCH

During a three year research phase we, Patricia J. Reis, Taguhi Torosyan and Stefanie Wuschitz explored alternative materials and means of production. We in particular investigated sentient, low-impact, non-toxic, fair traded, recycled and urban mined materials. The driving force behind this project was the intention to challenge the hardware industry. And to alter the harmful economies of the common PCB (printed circuit board) in artistic, creative, positive and comprehensible ways.

FEMINIST HACKING

We applied feminist hacking as an artistic methodology. Feminist hacking as a methodology implies an unorthodox approach to electronics - queering, questioning and deconstructing biased tech culture.² In order to do this it is crucial to create safer learning environments and knowledge exchange among peers. Feminist hackers share

their knowledge in workshops and collectives to encourage more accessibility, diversity and openness. Critical Posthumanism became a fruitful theoretical framework and compass in this endeavor of developing Feminist Hardware.^{3 4 5 6}



IMAGE 1 . Feminist Hardware. Clay collected and fired with prehistoric techniques in rural areas of Austria serves as the base for a circuit board equipped with recycled and urban minded electronic parts (2023, Vienna, Janine Schranz)



ENVISIONING FEMINIST HARDWARE

Our initial idea was to develop a microcontroller PCB that could work with a commonly used chip. This chip, the ATmega328P, is known for being the heart of the famous Arduino Uno board (or Arduina as some feminists call it). Why this chip? We are part of Mz* Baltazar's Lab, a feminist hacklab and artist run off-space based in Vienna, Austria. Here, at Mz* Baltazar's Lab, the Arduino Uno has been our favorite microcontroller in the past twelve years. It was designed to allow non-experts and amateurs to build interactive electric circuits. After using Arduino in many prototypes, artworks, workshops, we had many malfunctioning Arduino boards left. It turned out that their chips were actually still working. The idea was to re-use these chips in our new project.

The second idea was to come up with an electric circuit that would allow us to receive several forms of input signals (from self made analog and digital sensors) and generate a variety of output signals to control leds, motors and speakers. To build the base of our PCB we needed insulating, sustainable

IMAGE 2 . Feminist Hacking. PCBs before conductive ink from recycled silver is applied (2023, Vienna, Stefanie Wuschitz)

and robust materials (maybe eggshells? Wood plates? Wax? Ceramics?). We immediately went for ceramics, in particular porcelain, as it already plays an important role in electronic components such as capacitors, piezos, resistors, etc... Porcelain is an industrial made material composed by Kaolin (the main ingredient that makes it plastic and white) and Stone Pottery (the second ingredient that makes porcelain translucent and hard). Both are well known commodities prospected and mined around the world, in small scale in Europe and larger scale in China, Brazil, South Africa, Vietnam (among others).

In pottery, Porcelain, also known as China Clay, is a very delicate and sensitive material, (we could say it comes with its own agency), more difficult to control if compared with other industrial clays. Along with the other harder and resistant stoneware clays it usually requires higher firing temperatures in two stages: a first firing known as ceramic bisque of c.a. 1000o C and a Glazing firing around 1200o C in an electric kiln. During our first experiments with Porcelain we were immediately aware that those higher temperatures and therefore electric consumptions were not compatible with our standards for Ethical Hardware.

It was exactly when we struggled with the question of how to manufacture clay in low energy and low impact ways, that we came across the work of Heinz Lackinger.⁷ Heinz Lackinger is a pottery crafter in rural Austria who works with prehistoric techniques of firing clay in an open wood fire. Instead of sophisticated machines, he only uses a simple hole in the ground of his 18th century backyard house. We had the privilege of spending two days with this skilled craftsman, learning how to identify and collect the clay, how to model it and fire it just using old, dry branches collected from forest ground. If the clay is collected in awareness of its many qualities and in small quantities only, this process can be defined as 100% fair trade and congruent with locally sourced modes of hardware production. We owe the knowledge required for the following steps to Heinz Lackinger's generous knowledge transfer during his workshop and our own experiments with later applying this technique in the making of Natural Clay PCB boards.

ELECTRIC COMPONENTS

An estimated 90% of the electric components are still built in extractivist, environmentally damaging and exploitative ways and not re-used. This is why this project mostly relies on salvaged and recycled electronic parts.

We contacted many hardware manufacturers and electronic companies asking for the source and composition of their products. In most cases they were not able to report on the entire list of



sub-sub-subcontractors who supply them with necessary materials. Supply chains are usually long and not monitored by any larger entity, which means that currently hardware manufacturers are not held accountable for human rights violations or contamination further down the commodity chain.

There are, however, several initiatives and networks organized by citizens around the globe that inform companies and even collaborate with larger corporations to extend their product range with recycled or responsibly mined products. For example Stannol: this large company collaborated with Fair Lötet, a small Germany based initiative. Stannol now sells urban minded solder on a large scale through their platform. Also the company Wolfram in Austria is recycling the metal tungsten industrially. Another example would be Metallpulver24, a German company, recycling metal powder, such as silver, for producing conductive ink. The Belgian company Ögussa specializes in recycling gold. We used Stannol's recycled solder as well as Metallpulver24's recycled silver powder for the conductive lines on the board.

MAKING A BIODEGRADABLE CIRCUIT BOARD

Making your own circuit boards is not a new thing, almost every Makerspace or Hacklab offers workshops on how to accomplish this. Yet, the boards are usually built from copper layered plastic boards. The copper on the surface of the boards is then exposed to light (similar to analog photography development). This process leaves behind only around five percent of the original copper surface (the rest gets wasted) in order to form the conductive lines required for the electric circuit. Feminist hardware tries to reduce the use of copper and avoid plastic. We instead manually added conductive ink in thin lines, ink that was made from recycled silver. This way all precious and contested material applied to the surface was being fully used.

ETHICAL HARDWARE KIT

This board from clay with its recycled electronic parts represents the core element of a larger kit. This so-called "Ethical Hardware Kit" consists of different materials, liquids, tools and organic matter. International experts and artists contributed additional

parts to this kit, like for example a self made speaker contributed by Hannah Perner Wilson. The manuals of how to create these contributed parts yourself are attached to the kit's backpack. The kit can function as an emergency backpack that one could carry into the forest to tinker on a remote location. But it also functions as a base for workshops. We gave several citizen science workshops to kids aged 6 to 15, inviting them to speculate on possible biodegradable computers for the future. The kit was also essential during a workshop for feminist artists at Hangar, Barcelona, to inspire new circuits, poetic solutions and joint projects.

CONCLUSION

The PCB from natural clay is equipped with recycled electronic components and embedded in an Ethical Hardware Kit. They are by no means mass products. Each kit is a unique piece and as such a speculative object that aims to express our desire for alternative worldings. Yet, they in fact do work and can be used, either by artists, designers or hackers to build interactive circuits.

It is possible and intended to reproduce the Ethical Hardware Kit step by step by yourself, building your own version of it. Individual steps on the way can be accomplished even by little kids, such as molding the clay and making an imprint on it for painting conductive lines. For other steps, basic experience in soldering and physical computing is recommended. For raising awareness through workshops in schools, we generated an interactive storytelling website: the Salon of Open Secrets. Here kids can click their way through an animation that serves as an introduction to the complex issue of hardware production. [\[QR code 1\]](#)

IMAGE 3. Ethical Hardware Kit. The backpack for three hardware kits plays with the idea of a post-apocalyptic research lab, which supports the carrier in building new ethical hardware on site (2023, Janine Schranz)

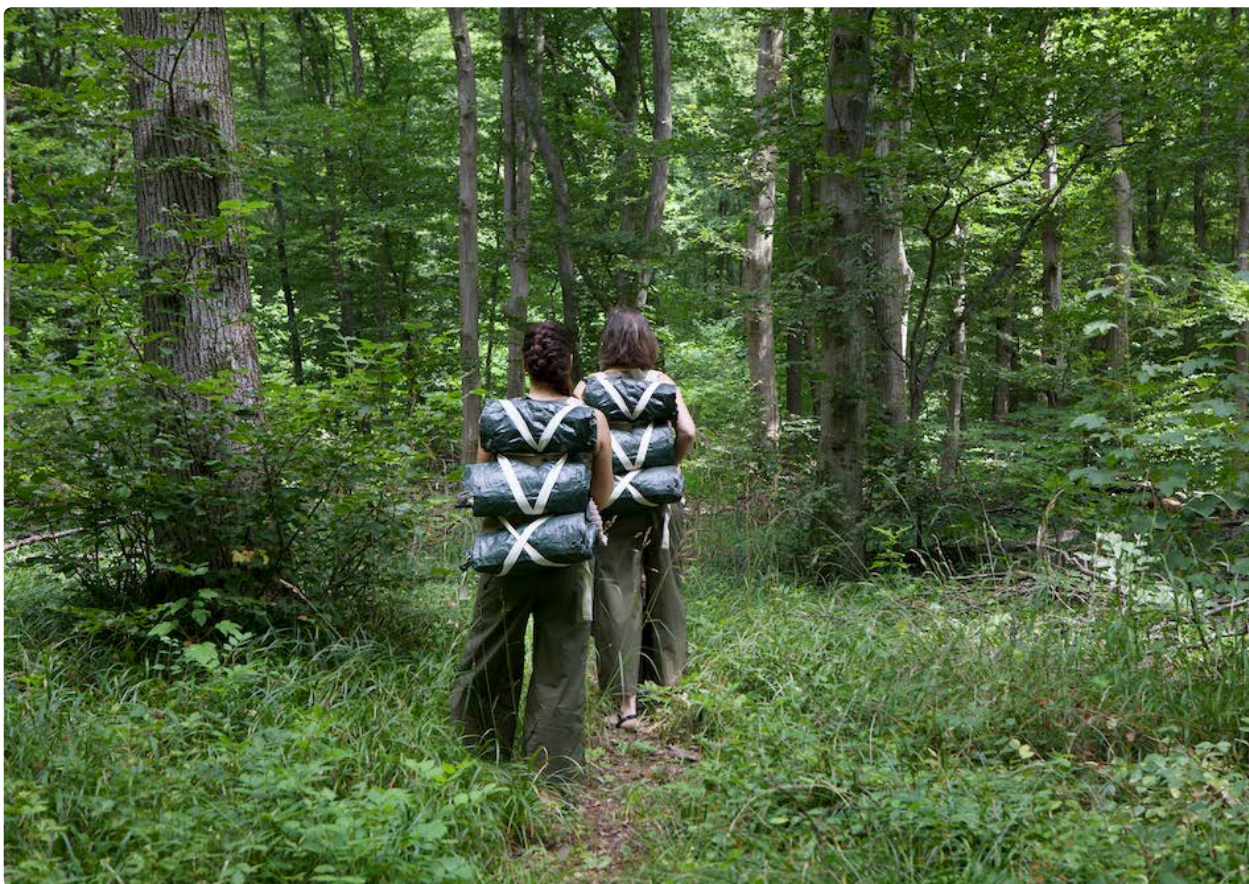


IMAGE 4. Nomadic Hacking. The Ethical Hardware Kit contains several elements, such as conductive, resistive and non-conductive materials to build interactive circuits from. It also entails contributions by international experts such as a self made loud speaker by Hannah Perner Wilson. The bags themselves were tailored by Erika Farina (2023, Janine Schranz)

IMAGE 5. Clay. The prehistoric and rural practice of firing clay was crucial for manufacturing a speculative, fair trade PCB, consisting of locally sourced or recycled materials (2023, Janine Schranz)

IMAGE 6. Salon of Open Secrets. Children aged 6-15 played with the ethical hardware kit and came up with ideas for future computers that can turn into soil again. To introduce them to the issue of e-waste they could play an interactive story online. The image is a still from the Salon of Open Secrets Interactive Storytelling (Credits: Stefanie Wuschitz, Visual: Stefanie Wuschitz)

IMAGE 7. Workshops. In workshops participants could use the Ethical Hardware Kit to build their own feminist hardware. It was part of a Citizen Science Project funded by FWF. The image is a still from the Salon of Open Secrets Interactive Storytelling (Credits: Stefanie Wuschitz, Visual: Stefanie Wuschitz)

INTERPRETATION

Mass production requires large amounts of homogenic materials and ideally identical electronic parts. This way even mundane and seemingly innocent materials (such as sand) become contested, scarce and the mining problematic for local communities.⁸ We are therefore aware that we did not address the inherent and harmful dilemma in tech production. Yet, we have successfully started many individual conversations (with experts, kids, students, artists and activists) on how to avoid e-waste, demand better working conditions, reduce wastefulness and create better futures.

What about the fair trade aspect? Is local, rural, decentralized production providing more safe and human-centered working conditions? We believe that small scale production can improve conditions for workers. Yet organizing in unions and checking global labor standards repeatedly and by an independent authority is still necessary in order to make sure workers are not at risk and living precarity. Only if working conditions are consistently monitored and companies made accountable for the entire commodity chain might things improve.

HARBORS

The art of sewing culture and nature

By Vincent Guimas from Ars Longa

INTRODUCTION

HARBORS means Highlight Actions Reconnecting citizens with the Beauty Of Rivers and Seas. The project was initiated by the Ars Longa association in 2020 and supported in 2022 & 2023 by the European Institute of Innovation & Technology (EIT) ¹ through its cluster Climate-KIC ², Europe's largest public-private innovation partnership focused on climate innovation to mitigate and adapt to climate change.

What is a blue corridor in a city ?

The blue corridors are those aquatic urban areas in the heart of the town whose nature has been transformed over the course of human history and in the service of the city. At the turn of the millennium, after several decades of slow industrial decline in the urban fabric and the arrival of new modes of logistics, the riverbanks once again began to become a space in demand by citizens. These transformed natural landscapes, interwoven with our imaginations, have become new promises for urban development and transformation, for cities that are more in tune with the climatic, ecological and social challenges that lie ahead: challenges for which the activity of major urban centres is largely responsible.

Like many of the world's major capitals, Paris is developing its blueprint, still remembering recent episodes of flooding and pollution. Paris will be hosting the 2024 Olympics, a testament to this new marriage between water and the city. These major riverside development programmes are a great opportunity for economic investors, and the inauguration of the Olympics will show the world what magnificent leisure areas our quays are. But the fervour of constructional genius, the economic and tourist promises make us forget what is essential. Above all, the blue corridors should be re-considered as the outposts of a new dialogue with Nature, a playground where social inclusion is the rediscovered relational system between Culture (human activity) and Nature (all living things). Blue corridors (rivers, lakes, coastlines, canals) are fantastic laboratories and open stages in the heart of the city for exploring our future, the pledge of a living world.

The river as a tool for dialogue with the living world

These blue corridors are often the first visible urban witnesses of the climate change that is shaking our certainty about the sustainable relationship between human activity and nature. HARBORS wants to collect these testimonies and build a toolbox that we call "semaphores" to help our translators but also to dialogue with nature. Faced with nature's warning signals - turbulent or friendly - the time has come to look at it and read it differently, to envisage the long journey of living things on earth as a system of listening and sharing that is both desirable and sustainable. This work of figuration and interpretation, but also of facilitating dialogue for a wide audience, is today a blind spot for most political decision-makers, but also for citizens and creative people. Rethinking our relationship with rivers, riverbanks, seashores and lakes is not an easy or obvious playground for designers, because these environments are often difficult to access or constrained, starting with their banks. Yet today they represent a crucial and exciting place to work that the project HARBORS is trying to design. A place where knowledge, ideas and projects can come together, comparable to the workshops that have appeared over the last two decades, those we call "FabLab" or "MakerSpace": a semaphore workshop.

From flooding on the Seine to the Paris Olympic Games

The recent flooding of the Seine in Paris and the surrounding area in June 2016 and January 2018 has had a major impact on the ecosystem of river businesses, sailors, industrialists and floating establishments. These two natural disasters in a short space of time have had the effect of bringing together and federating worlds that had been rubbing shoulders without really knowing each other, leading to the emergence of a multiple and united identity, a people of the river. Once the emergencies and repairs were over, these newly-formed people spontaneously expressed a common need, that of inventing a creative time on the river that would reflect it: ecological, learning, committed, festive and beautiful. In fact, we could see the inauguration of the

Paris Olympic Games on the Seine as a sign that we are collectively seeking to rediscover our relationship with our river. Could it also be an invitation to other cities in Europe and around the world to do the same?

From tragedy comes promise

HARBORS is a promise born of tragedy. First and foremost, it is about changing the way we look at things, imagining together and sketching out the city of tomorrow as it transforms itself on and beside the water. It's also the pleasure of sharing a passion for waterways, discovering the people who work on them, those who bring them to life, and sharing unique experiences together. Finally, it's the desire to write a great collective metropolitan narrative, including non-human inspirations, a contemporary legend, a mosaic of hundreds of little stories that tell the story of our relationship with water, alongside a wide variety of partners and in a cooperative and inclusive approach.

What's the point of talking design at the water's edge?

That is the way, after two major floods on the Seine, Ars Longa was asked to take part in a new festival on the Seine called Odysséeseine ³. Spearheaded by the charismatic Ricardo Esteban, his team and a host of river professionals, this annual event, which runs from March to September, was conceived as a reverence for the Seine, a gesture between popular culture and sport four years ahead of the Paris Olympic Games. From a flooding disaster, first dialogues, conversations and actions started, like weak signals to call a stronger movement to act intentionally and preemptively, a signal to hence where design comes in. It was the start of a reflection on the possible role of creative talent in designing what these friendly gestures could look like, these forms of invitation to renew contact with the river. By observing similar movements of interest in blue corridors abroad, driven by new narratives and dynamics of citizen engagement, we have defined an initial crucible of writing and prototyping to welcome diverse experiments by designers and artists. We hope that this article will provide an insight into the field of experimentation and open up the possibility of future collaboration or participation within our Distributed Design network. The article is structured around HARBORS' three actions: LEARN, ACT and SHARE.



IMAGE1. Pool Stack. Graphical representation of the different scales and modes of design intervention for blue screens (November 2023, Vincent Guimas, open licence)



LEARN

A "citizen" movement towards the riverbanks

The river and the city have formed a pair since the birth of cities, both in terms of discourse and projects. Over the last 20 years or so, there has been a growing concern to preserve nature and the aquatic landscape, and to improve the ecological, aesthetic and social conditions of these very damaged environments. And yet, while ecology is invoked in all operations to reclaim and transform urban riverbanks, even becoming the spearhead of this 'reconquest', we still find today that this desire sets its objectives in terms of aesthetics and comfort, far from the promise of a new ecosystemic scheme. The many studies on the subject of reclaiming rivers inevitably show a deviation from the emergence of ecological concerns. While the majority of aquatic urban landscapes share the characteristics of former industrial sites with land administered by the State, the re-appropriation in the 2000s by local authorities of these areas to be transformed and the emergence of new artistic, cultural and social practices in the urban environment are still an opportunity to be seized to develop a new approach to urban ecology on a micro-local scale. Access to the riverbanks is once again possible, allowing new experiments to be carried out at the crossroads of a number of disciplines, and open research to be undertaken by bringing together a wide range of expertise, providing a favourable framework for citizen and participatory science. It's in this context that HARBORS proposes learning about these ecological issues in contact with water.

Learning from past creative experiences

HARBORS traces its roots back to the many cross-disciplinary artistic projects of the 2000s, which set out to reclaim the city based on access to land 'in transition' and on the spirit of adventure, openness and sharing embodied in the promise of Open Source and the Internet. It's also a time when designers are called upon to "assume their responsibilities and create links between human activities, from the economy to politics, from science to religion, from education to behaviour - in short, all the areas of the social fabric"⁴ wrote Michelangelo Pistoletto in his 1994 manifesto. The convergence of the worlds of architecture and design is beginning to re-invest in social commitment, and the figure of the inhabitant-user is appearing in many projects with forms of (re) learning collective practices.

Buoyed by the hope that systems would continue to be open and accessible (open source systems and objects), and the practice of making things locally revived by the FabLab movement, Europe saw the emergence of a large number of collectives at the crossroads of many disciplines, working on aesthetic and social research-actions: Raumlabor⁵ (DE), Umschichten⁶ (DE), Basurama⁷ (ES), Public Works

IMAGE 2. First sketches for the decoration of a PRAM in Ivry sur Seine (Southern Paris suburbs), in 2021 (2021, Ivry sur Seine, Vincent Guimas, open licence)

IMAGE 3. Meeting of all the participants in October 2022 at the PRAM wintering site, Les Amarres, in the 13th arrondissement of Paris (October 2022, Les Amarres, Vincent Guimas, open licence)

Group⁸ (UK) or EXYZT⁹ (FR) in France. These projects were concerned with social and environmental issues, and focused on small-scale innovations on a local scale, with a particular emphasis on building up a community of professionals, amateurs and citizens. François Jegou, founder of Strategic Design Scenarios (SDS), an innovation laboratory specialising in public innovation, said in Strabic "Groups who decide together, in a neighbourhood, in a street, to put in place a solution for themselves, to solve their mobility problems for example, or to buy vegetables together from a local farm where they know the ins and outs a little better..."¹⁰. We are also seeing the emergence of experiments involving the design of housing for undefined use in the city, in order to reintroduce the unexpected, and thus the freedom to experiment with new forms of organisation. In 2009, the Théâtre Évolutif experiment, carried out by artists, designers and researchers at Bureau d'Étude¹¹ and presented at the EVENTO event (Bordeaux, France), was my first encounter with the idea of rethinking the cohabitation and dialogue of all living beings in the urban environment. There's probably a hint of the memory of these creative experiments in public space in the principle and methods of the HARBORS project.

The river as a space for learning

Understanding the river and learning from it can become one and the same in our project. And that's a good thing. Our starting point is the idea that we are all inhabitants of the water, but that access to it is more difficult for some people. And while the analogy with knowledge and culture may seem arbitrary, we accept it. Paris, the city of light where culture is on offer every day, is experiencing a brutal paradox. It is closed to most of its inhabitants living in the suburbs. The vast majority of low-income and vulnerable people often feel downgraded, not belonging to this city centre that doesn't know how to communicate with its suburbs. That's why, from the outset of our activities, learning has been the primary condition for formalising and writing the project.

The river, and more broadly the blue corridors, are by their very nature open, playful and participatory places of learning. It carries with it our history, our geography, and much of our technical knowledge was born with it. These urban aquatic spaces have nourished our writings on war and love. These natural environments in the heart of the city are common to all the peoples of the world. So it's only natural that they should once again become a space for participatory research, where expertise is brought together in a multidisciplinary, horizontal way to open up the project to an open, citizen-based science.

Since 2021, this lever has taken several forms. The first has been learning visits along the Seine and canal to meet professionals working on the Seine and canals. Aimed at participants in shipbuilding workshops, the Tour de Fab¹² proposal brought together young people who had dropped out of school, the unemployed and migrant associations. During a bike tour, participants discover the trades, skills and passion that drive river professionals: construction, freight, sport, ecology, history and culture.

Heritage research as levers of actions

In 2023, certain themes have begun to stand out and form the specific features of our ambition for apprenticeships. Ecology, heritage and democracy emerged as the themes that would merge with our desire to act. Inspired by one of the Reinwardt Academy work methods and analysis named Emotion Networking which works like " ...an exercise in understanding the complex interactions between emotions, interests and different types of knowledge..."¹³ by using complex dynamics of heritage research fields. HARBORS used this method for 2 Seine heritage workshop sessions during an event called l'Assemblée du Fleuve, which took place on Thursday 14 September 2023 at Les Amarres (a former industrial site on the river that has become a social and cultural venue for migrants). As part of a new HARBORS project to be carried out in Barcelona from September 2023 to May 2024, a new workshop will be offered to secondary school pupils on the memory of the port city and the ecological issues it faces, and more specifically its water stress.

Building community, the River Assembly

The River Assembly, mentioned earlier, is another original form of peer-to-peer learning. Tested for the first time last September in collaboration with several other organisations (in Palermo, Copenhagen, Amsterdam, Budapest and Barcelona), we were able to unfold the three main themes through a European prism. By setting up projects in the heart of cities with very different social, political and ecological contexts, we were able to initiate a series of conversations on the history of each city with its blue corridor and explore the common ground, the opportunities for dialogue and the learning spaces that each situation offers to facilitate 'living' together.

Finally, in a collaboration with the town of Ile Saint Denis, north of Paris, HARBORS will be accompanying the town's municipal council, which wants to put the River's various promises at the heart of its actions. Starting this year, we will be working together to create a Maison de la Seine, a place to understand and experiment with new interactions between Nature and the City. Measuring around 7 km long and between 100 and 300 metres wide, Île-Saint-Denis is the only French commune whose territory coincides perfectly with a river island. In short, it's an ideal place to learn, experiment and share knowledge.

ACT

What does it mean to act ?

Act is not just about doing something, it's about getting involved in the world and changing it, producing effects. Our actions have consequences for us, for others, for nature and for the world, and these consequences can be beneficial or harmful. Taking action also means understanding that action cannot be reduced to the consequence of prior reflection. Not, of course, that we shouldn't think before we act, but we must understand that true action has a great deal of truth in itself. And our times seem to nurture a desire for collective and individual action - for political commitment - through doing to understand, dialogue and react to the complexity of the present and future world. It's an ever closer, instinctive, almost animal way of doing that leads us to the workshop.

What can HARBORS tell us about "driving design" ?

The figure of the designer-maker is an essential link in the chain of action. Thanks to their ability to construct forms that serve as a social catalyst, creative talents are able to create a local awareness of climate and ecology at the heart of the city. Their actions can unfold different types of interaction: inviting residents to look at things through visible participatory design and construction processes that encourage a different reading of the place where they live, opening up access to the tools and methods of making things so that people can relearn how to use their hands in the service of a collective project, and stimulating learning processes and access to knowledge through very concrete projects that link research, education and creative practices while encouraging different social backgrounds to mix their global vision and local know-how on a common field. These practices can be seen in shared gardens (vegetable or botanical), repair workshops or shared kitchens.



IMAGE 4. Details of the Emotion Networking workshop in September 2023. In collaboration with Jonathan Even Zohar and Marit Vandijk from Amsterdam University of the Arts, and Jules Rijssen from Imagine IC, Amsterdam (14 September 2023, x, x)

IMAGE 6. Details of the Emotion Networking workshop in September 2023. In collaboration with Jonathan Even Zohar and Marit Vandijk from Amsterdam University of the Arts, and Jules Rijssen from Imagine IC, Amsterdam (14 September 2023, Natacha Gonzales)

IMAGE 5. Social Regatta in front of French national Library François Mitterrand (September 2022, Paris, Vincent Guimas, open licence)

The micro-shipyard, a weaving place between Culture and Nature

For HARBORS, design is conceived as the ability of creators to sew together Culture and Nature in an inspiring and very local way. We call on these assemblers to create a new way of listening to and dialoguing with the river. Each creative intervention must be thought of as a language tool, a 'semaphore' capable of producing the signs that will engage a broad public towards a new vision of the blue corridor, a vision that in its own way would like to contribute to refining the compass and the course of the New European Bauhaus. The action that leads to this semaphore must be a participatory one.

Over the last four years, we have concentrated our efforts on designing and activating a mobile urban micro shipyard. It is both a workshop and a knowledge assembly. For six weeks, the handiwork helps to open up and share the different realities, feelings, and hopes brought by the participants. At the heart of the project is a small wooden dinghy called PRAM, designed to be built using the sew-and-glue technique. The boat was designed by the young naval architecture agency BOW¹⁴ (Youri Guedj and Alan Le Calvez) and tested in a participatory workshop by the architects and designers collective Bleus Paillettes¹⁵ (Charles Herrou and Tristan Fernandois). Inspired by old Parisian dinghies and DIY construction techniques, the PRAM is designed as an object of desire and sharing. Its aim: to make you proud of your hands and inspire you to sail together in the same direction, in dialogue with the river.

What is the PRAM?

Designed to ply the small seas, rivers, canals and ponds, PRAM is intended for cruising and single-handed one-design racing. Built like a catboat, with a laminated plywood hull, the PRAM is simple to build and use. It favours traditional amateur construction while reinvesting the codes and knowledge of contemporary naval architecture (inverted bow and planing hull). It follows in the footsteps of the prototypes developed on the waterways of the Île-de-France region in the first half of the 20th century (Moth, Chatou Prototype, Nogent-Joinville Prototype, Sharpy, etc.). Agile on water and on land, its dimensions correspond to the classic Moth class and the boat can be towed by a bicycle, carried by two people and launched solo.

It is interesting to look at the specificity of the contemporary mixed construction method using wood (plywood panels) and composite materials (resin and plant fibre fabric) to bind and seal the hull. This method involves assembling, sometimes temporarily, pre-cut plywood panels to the final dimensions. Once assembled, the panels are joined by a mesh of epoxy

resin and, if necessary, reinforcement by fibre and resin lamination. In principle, this technique limits hull design to the use of developable surfaces (i.e. surfaces that can be unrolled in plan). Stitch-and-glue hulls allow for a variety of geometries, such as sharp chines (angled edges between two plywood panels - as in the case of the PRAM) or clinker planks (superimposed plywood panels). While laminated stitching is a contemporary construction process popularised in the 1960s, the principle of stitching planking, which gives it its own structural strength, has a long history. It can be found on many historic boats. Among the oldest traces of stitched boats: the solar boat of Khufu (2,600 BC), found in front of the Great Pyramid of Giza, measures 43.5 meters. It was intended to be a funerary worship, but was probably inspired by the boats used for navigation. There is also the Karelian language (western Russia), in which shipwrights are always "boat seamstresses".

How does a boatyard come into being?

The workshop is at the heart of the HARBORS approach. It is the parliament of the hand, a space for learning and democracy in the service of commitment and inclusion. In our initial experiments, the workshop is a micro shipyard. It is made up of a workshop leader, who may be a craftsperson, an architect or an artist, who accompanies participants supervised by a neighbourhood outreach or integration structure. For each workshop, we try to involve a sports referent: an association, club or nautical base, and a cultural referent. It all starts with the opening of a tailor-made workshop and mentoring space, open to all, to help the team discover the world of inland waterways and imaginary worlds, as well as cultural and sporting activities. Since 2020, ten participative micro-shipyards have been organised, providing an opportunity to experiment different ways of building.

Social and technical innovations

Inclusion is the second cardinal value of the project. Diversity is at the heart of the shipyard creation process. By working closely with partners in the field, we are able to identify participants who are far removed from cultural and sporting activities. The aim of the workshops is also to encourage group work, mutual respect and regular attendance. Ultimately, the micro-shipyards are intended to be a springboard towards training or employment. The PRAM programme has been designed to be accessible to the general public, and its construction enables people to improve their skills in a number of techniques throughout the process, as well as learning about the water industry. The discovery trails enrich the experience through meetings and exchanges that are likely to encourage people to take up water-related careers.

As well as the constructive part, participants have the opportunity to discover the aquatic environment of their neighbourhood and their town thanks to the discovery trails that are organised: visits to natural, cultural and sports sites and industrial boats, meetings with the various sponsors, players in the river and canals, etc. Each participant in a boatyard receives a construction manual, to accompany the adventure of their project and contribute to its enrichment. The manual links learning and action. The first point is care and respect for the environment. How can a worksite be a tool for raising awareness of the common good and a powerful lever for transition in our individual and collective practices and behaviour? Consideration has been given to the traceability of the materials used, from the architectural commissioning stage right through to the transportation of the boat. A number of issues are then addressed in the shipyards: How can leisure boatbuilding be exemplary today? What resources can be mobilised in the urban context? How can the PRAM production chain integrate these constraints and become innovative in a short circuit? How can zero waste be achieved on a site-wide scale, as part of the "city of manufacturing"?

Every year, at the various micro-shipyards, participants - some of them socially excluded - come forward to share their expertise: a former Senegalese shipwright, a Moldavian lacquerer, a rope-maker, a high-school sailing champion... PRAM becomes a laboratory for sharing. The workshop leaders, who are often young designers or architects, become the mediators in an ecosystem that becomes more autonomous and more responsible as construction progresses. They often add a research-action dimension to the circular economy and low-tech innovation (low-cost rigid sail testing, DIY friction knots, etc.). The experience is a collective reflection and a global approach to make the shipyard an exemplary project in terms of compliance with environmental standards.

When creative talents inspire HARBORS

Last four years, we've seen a number of other inspiring projects in France and abroad that cleverly address this ability to make our relationship with urban aquatic areas visible and poetic. I'm thinking in particular of the Dodola¹⁶ bio-vernacular water filtration system designed and produced by the Slovenian collective Pjorkkala, the fascinating work of artist Robertina Sebjanic on oceans and recently on rivers, or Yan Tomaszewski's artistic performance Sequana,¹⁷ which reconstitutes and deposits in the bed of the Seine to heal it. This artistic reverence is inspired by the age-old rituals of peoples living in Burgundy, who came to lay wooden figurations of their sick bodies at the source of the Seine, which was called Sequana at this time.

SHARE

"Water has meaning for everyone. It unlocks our imaginations, it allows us to build a common identity through something that belongs to everyone" said Ricardo Esteban in an article published in the national daily Liberation.¹⁸ Ricardo is the promoter of the Odyssee Seine festival, on which our activities are based, outlines the storyline for us every autumn in September. It's a tale that brings together the different peoples of the water, and reminds those furthest from the centre of the capital that the Seine belongs to them too. This time of sharing is first and foremost a time of celebration, organised into 3 stages: the procession, the solidarity regatta and the river assembly.

Folk procession

The procession from the shipyards to the river bank marks the start of this first moment of celebration. Led by participants in the construction of the PRAM, the public is invited to join in the procession, singing and dancing in honour of the river and the neighbourhood's participation in the solidarity regatta. As it leaves the building site, the boat leads the procession, followed by banners symbolising the spirit of the river. This parade, inspired by certain pagan, festive and sporting practices, has a number of functions that we think are worth activating with a public that is often vulnerable: reinforcing the feeling of belonging to the City of Light and its river, and team spirit.



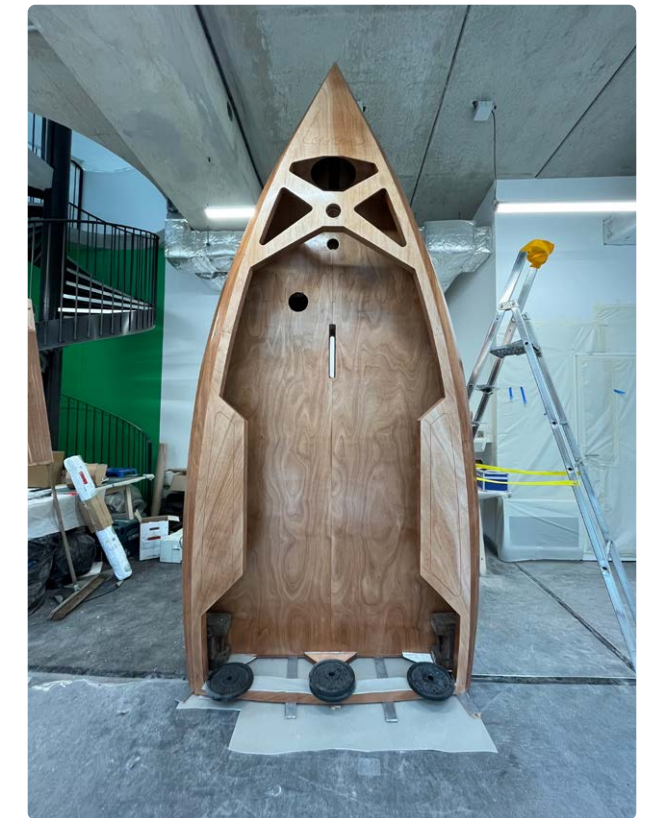
IMAGE 7. Preparing the micro-shipyard in Ivry Sur Seine (southern suburb of Paris) (July 2021, Ivry Sur Seine, Vincent Guimas, open licence)



Social Regatta

Inspired by the Palio di Siena, a horse race where different neighbourhoods participate twice a year on the central place "Piazza del Campo", we manage each year a Social Regatta which is the second key moment for the project. It brings together all the PRAM built in the various neighbourhood workshops. Each boat has its own name and the colours chosen when it was built. The skippers taking part in the race are seasoned sportspeople, along with newcomers to the sport. It's a moment that brings festival-goers together around the values of sport and culture. It's a real regatta that takes place over a 3-hour period to the sound of brass bands and chants on the quayside and banks of the Seine, opposite the race. It is essential that the regatta builds its identity on the balance between the worlds of Sport and Culture to encourage cultural diversity and social relations.

IMAGE 8. Details of the construction technique Sewn and Glued (July 2023, Paris, Vincent Guimas, open licence)



A River Assembly

Lastly, the River Assembly,¹⁹ which we organised for the first time on Thursday 14 September 2023, aimed to invite artists, architects, scientists, entrepreneurs and elected representatives to share their vision of the blue network in the city on three subjects: the history of cities in relation to their watercourses and the forgotten powers of the river; imaginations in the face of ecological, social, economic and climatic challenges; and finally the river as the common ground for geopolitics in the face of the looming crisis. The meeting brought together initiatives from Paris, Copenhagen, Barcelona, Amsterdam, Budapest and Palermo.

CONCLUSION

Learn, Act and Share are the three HARBORS action verbs that enable us to recreate a dialogue between Nature and Culture at the heart of urban blue spaces, in order to tackle climate and ecological issues at a local, citizen-driven level and produce a new social and political narrative in the face of the challenges that lie ahead. The river and its banks are a powerful crucible of shared history. The course of a river, from its source to the sea or ocean, is the most powerful representation of a country. It defines the catchment

IMAGE 9. Finishing touches to the PRAM at the end of construction on the Rosa Park site in northern Paris (2023 July, Paris, Vincent Guimas, open licence)



area. By taking action on a hyper-local scale, it is the interaction of the different dimensions and possible modes of action that interests us.

HARBORS proposes a framework for action at catchment scale that we call Pool stack, in reference to the work carried out by the Fab City Foundation with its representation of the movement's urban action framework entitled Full Stack. Obviously, our actions and our plea for a change in individual and collective behaviour must take place on a city-wide scale. By setting up our laboratories on the banks of the city, facing up to this natural heritage in motion, we are questioning our desires for a future together. The river is a place of life as much as a place of threat or phobia, an age-old frontier zone that at the same time offers the promise of a new horizon. That's why HARBORS unfolds through different imaginations. Accompanied by the work of philosophers, researchers and lawyers, citizens open up new narratives on deep ecology, helping us to take Action. The ethnologist and philosopher Philippe Descola, the jurist and essayist Camille de Toledo and the young lawyers' collective Wild Legal offer us wonderful gateways to new practices that borrow from animist practices a way of thinking and doing that fascinates us as much as it opposes our usual way of seeing.

And it is exactly here, by combining the notion of urban aquatic landscapes such as rivers, seas, lakes, ponds, fountains... with forms of contemporary animist practices that we are calling on creators to intervene. We are convinced that it is at this crossroads that new lighthouses must be created to represent a world that connects Beautiful, Together and Sustainably. For us, the lighthouse takes on the appearance of a workshop with technical and poetic semaphores for working on a modern, citizen-driven ecology. HARBORS favours these prototyping spaces for small forms of dialogue that are accessible to all.



Modestly and in its own way, HARBORS distills drop by drop a source for understanding and sharing the challenges of the Anthropocene at the level of the citizen and re-considering the aquatic space no longer as a figurative, functional object, but as a 'being', a subject capable of communicating. The prospect of combining knowledge, creation and celebration and updating a new model of contemporary animism is an exciting and provocative vision for rethinking action in ecology, an action that must take as many forms and games as our imagination is capable of shaping.

IMAGE 11. PRAM participative micro shipyard, Bagnolet (East of Paris) (2021, Bagnolet, Vincent Guimas, open licence)

IMAGE 10. Preparing the Seine Odyssey parade, from a Parisian shipyard to the Seine and the Social Regatta (2022, Morgane Melou, open licence)

IMAGE 12. Sewing of the "Chat Chiron" PRAM on the Rosa Park site in northern Paris (2023, July, Paris, Vincent Guimas, open licence)



IMAGE 13. Social Regatta in front of French national Library François Mitterrand (September 2022, Vincent Guimas, open licence)

IMAGE 14. Social Regatta in front of French national Library François Mitterrand (September 2022., Paris, Vincent Guimas, open licence)



IMAGE 15 & 16 River Assembly. European meeting on the various experiences and possibilities for action by creative people to combine culture and nature, thanks to the blue corridors in cities. (September 14, 2023, Les Amarres, Natacha Gonzales)

IMAGE 17. Social Regatta in front of French national Library François Mitterrand (September 2022., Paris, Vincent Guimas, open licence)

The World as a Museum of Colonization

Unraveling colonial pasts to redesign presents and co-create equitable futures

By Carolina Almeida, Marielle Sam-Wall, Stella Dikmans from the Museum of Colonization



IMAGE 1. MOC Walking Tour in the center of Barcelona (21.06.2023, Barcelona, Fab Lab Barcelona)

ABSTRACT

In this piece, we argue that the modern world is a Museum of Colonization (MOC) and seek to provide examples of how designers can engage in decolonial action - simply by starting to detangle the storytellers and storykeepers in their lives. The article utilizes stories of the lived-experiences of marginalized designers, their struggles within colonial systems, and how this led to the formation of MOC. We provide examples of how the collective's projects disrupt oppressive and extractive world views - all while leaning on joy, accessibility, care, and love to do so. By illustrating our place-based approach, we hope to inspire other people to begin "MOCing" their cities, and start to create spaces reclaiming non-Western-centric pasts, presents, and futures. Additionally, the article helps to recenter definitions of "decolonization" within the design industry.

Given the evolving nature of our work is increasingly topical, more white European designers are leaning on the terms "colonial" and "decolonial" within their practice. While well-meaning, there has been a false equalization of "decolonial" with terms such as "equality", "diversity", and "inclusion" - ignoring the importance of Indigenous and marginalized voices leading this decolonial movement within design. To form our "recentering", we take inspiration from renowned decolonial thinkers, such as: Robin Wall Kimmerer, James Baldwin, Toni Morrison, bell hooks, Bayo Akomolafe, jaye simpson, and Malcom Ferniand. Platforming lived-experience and belief in what is doubted as "decolonial" must ultimately work towards repatriation of Indigenous land, life, and joy, while asking white European designers to sit with us in the uncomfortability of unlearning and relearning.

INTRODUCTION

The world is a Museum of Colonization - you just don't see it. All around us, in our classes, books, and built environment lay unquestioned narratives centering European perspectives. With Europe's colonization of nearly 80% of the globe, an exclusive Eurocentric history has been elevated to a singular truth.

The Museum of Colonization (MOC) exists to challenge this "truth" and exposes it as the singular "story" that it is. Our work engages in humor and play, poking fun at or "MOCing" the idea that all ways of life could originate from a mere 8% of the world (Europe). It is a lighthearted but powerful critique that sets the stage for deeper exploration of the impacts of colonization and how we can dream of more. With the underlying belief that community-based and intersectional storytelling, especially narratives from those most impacted by colonialism, is what can and WILL co-create futures fostering regenerative systems.

For those interested in colonization and the burgeoning movement of what "decolonization" looks like in Europe, this article stands as an entry place for learning and, more crucially, unlearning. Our article will be broken down into five distinct parts, each providing context, understanding, and transparency to our work. The sections are as follows:

- Building a Shared Lens: History, Inspiration, and Paying Respect to Those Before Us
- Lived Experience As Research: Detailing Author's Personal Stories of Colonization to Situate Ourselves Transparently
- The Creation of the MOC & Our Work: Creating Accessible Experience to Learn
- Calls for Accomplices: MOC's Dreams for the Future & Getting Involved

We hope to recenter the term "decolonization" on definitions brought forward by Black and Indigenous scholars and activists. Instilling that decolonization entails actions that bring "about the repatriation of Indigenous land, [...] life", and joy. A definition that pulls directly from Eve Tuck's and K. Wayne Yang's article "Decolonization is not a Metaphor". Like Tuck and Yang, we use this definition to combat the semantic drift of the term within design and other industries. Where more designers are using the term "decolonization" as a false equivalent for "inclusion and diversity" or as a synonym for "other things we want to do to improve our societies and schools".¹ By defining the term decolonization, we hope to re-center the people at the center of decolonial movements: Black, Indigenous, and People of Colour (PoC) communities.

The aim of our article is not to radically change minds, but to add more depth and variance to which one views the world and the work of "decolonization". We

hope to encourage the idea of "pluriverses", a term made popular by the anthropologist Arturo Escobar, that there are diverse and infinite ways of telling our histories, and thus manifold ways of constructing our futures.² We hope that while engaging in our work, readers will note the writers, activists, and community members we reference - as they are the basis of our practices. Specifically, we ask for engagement with work by Black and Indigenous communities that have long been the leaders of Decolonial action, yet have often been miscredited or excluded from this dialogue. We hope that readers will come along this journey with an open heart and reflective mind, and together many will begin to see the world as the Museum of Colonization it is, and more importantly, work together to make tangible changes.

BUILDING A SHARED LENS: HISTORIES, INSPIRATION, AND PAYING RESPECT TO THOSE BEFORE US

Before detailing our work as a collective, it is important to build a shared lens through which the work is approached. Our shared lens is the perspective or mindset that shapes how the MOC interacts with its environment. Within this section, we will provide context for our three main assertions in this article: first that the world is a museum of colonization, second that storytelling is a powerful tool of resistance, and third that decolonization must be an action. By providing our lens, we hope to build a shared understanding with the readers, and provide reverence to the revolutionary thinkers that inform our work.

The World is a Museum of Colonization

When we state that "The World is a Museum of Colonization", we base this on the most common telling of history while combining it with the drastically changing functions of the term "museum". Across the globe and especially in Europe and its former colonies there is an unquestioned narrative that with the expansion of Europe's control to approximately 80% of the globe, came a universal "good" and that the exploitation of non-Europeans was just a necessary step in human "advancement".³ What is left out in this telling is the brutality under which this "advancement" was exchanged for.

Dating back to the 15th century, European powers employed the Doctrine of Discovery, a legal concept that justified colonization by granting European explorers the right to claim lands they 'discovered.' This doctrine disregarded the presence and

sovereignty of Indigenous peoples, leading to forced displacement, cattle slavery, and exploitation of African, Indigenous, and Non-European communities. European settlers implemented policies of forced assimilation, such as the Indian Boarding Schools in the United States and Residential Schools in Canada, aimed at eradicating Indigenous languages, cultures, and traditions. Europeans also invented the category "race" to justify their creation and participation in the Atlantic Slave Trade and the continual dehumanisation of African people.⁴ The culmination of these efforts erased ancestral knowledge from Black, Indigenous, and People of Colour (BIPOC) communities and has led to intergenerational cultural trauma and marginalization that is still prevalent in society today.

Across the globe, European powers redrew borders (look at the map of the African continent) and imposed their languages, laws, and cultural norms across vast territories, often erasing or misappropriating global Indigenous knowledge and traditions. With their dominance over the globe, European powers rewrote stories to favour their ways of being and hide their brutality. This Eurocentric narrative, stemming from a mere 8% of the world's landmass (Europe), has overshadowed the existing diverse histories, traditions, and knowledge systems of the remaining 92%. This era of colonial expansion not only facilitated economic exploitation but also imposed Eurocentric ideologies, portraying European history and culture as central and superior. And still today, this lie of a "singular" telling of history is still perpetuated in our culture, from built structures to cultural institutions, this often being museums.

Storytelling as a Tool of Resistance

The name "Museum of Colonization" (MOC) embodies our aspiration to challenge these prevailing dominant narratives. The name itself acts as a form of resistance against the unilateral representation of humanity that excludes the vast majority of the world's people. Our use of the term "museum" started from a cheeky reclamation of a word that historically represented a space of marginalization (i.e. stolen artifacts, misrepresentation, exclusion). As the project went on, MOC became more inspired by emerging redefinitions of what a museum can be from BIPOC communities and allies.

According to Max Hollein (a white European middle-aged man), director of the Metropolitan Museum of Art in New York, today, "museums can be places to bring people together - where cultures convene across borders and nations - where people learn more about each other, both individually but also about how [...] we are all one - so to see our common history".⁵ Cameroonian curator and scholar Bonaventure Soh Bejeng Ndikung delves into the concept of the museum in an even further personal and collective

realm. For Ndikung, the body serves as a primary museum, bearing our personal backgrounds, whether we seek to conceal or amplify its doing through clothing, languages, or other expressions. Art spaces, on the other hand, represent secondary museums, possessing the potential to invite and curate experiences.⁶

With our use of the term, we propose the existence of a third type of museum: the realities we inhabit. Unlike the body or art spaces, this third type of museum exists as a suprapersonal, non-curatable entity. How the histories of these spaces are told, and therefore how we perceive the museum around us, depends on the lens through which we view the world. Our approach to a museum aims to be a brave space in which we can facilitate learning and understanding needed to expand personal and cultural lenses to see the misleading structures of Eurocentric storytelling. These lenses function akin to stories. And whether we listen to the colonial story or share and listen to manifold stories, is totally up to us.

Storytelling is a powerful tool for breaking free from the confines of linear, singular narratives of the past, present, and future. It has been an intrinsic part of the resistance and resilience of Indigenous and marginalized communities throughout history - it is a means of preserving cultural heritage, passing down traditions, knowledge, and values from generation to generation. The Asian-American anthropologist Anna Lowenhaupt Tsing talks about stories as forms of "attunement" to the complex and interconnected worlds we inhabit. To Tsing, stories are tools that can be used to understand each other or "attune" to others' lived realities.⁷ Meaning that although we have been taught some stories, we have the agency to make informed decisions about the stories we listen to, how they are told and who tells them. We believe that with this agency comes a responsibility to ask what stories and storytellers are missing from our collective social narratives.

The sustainable and non-human-centered design movement is a perfect example of questioning narratives of innovation and recalling Indigenous knowledge. With the climate crisis, there is a new wave of "innovations" that focus on using "sustainable" materials and methodologies. While this work is necessary, what is often embraced are concepts that emerge from sleek design studios in popular European cities that tend to pass off Indigenous knowledge, for example the sustainability and efficiency of mud huts which have long been known to Africans, as their own and "novel". Scientist and botanist from the Potawatomi Nation, Robin Wall Kimmerer, has highlighted that much of these practices are neither new nor urgently needed breakthroughs, but instead repackaged wisdom from Indigenous people who have been historically overlooked and demeaned. [8] BIPOC storytellers have long been missing from

the design industry, their stories and knowledge unclaimed or absent so their ideas are co-opted into designs that fit colonial narratives. This leaves out the depth and historical perspectives that, through collaboration and equitable access, could truly contribute to sustainable change. Without BIPOC and decolonial thinkers in this space, we are only told the stories of sustainability and "decolonization" through a European and/or white lens.

Both Tsing and Kimmerer emphasize collaborative storytelling that embraces diverse voices, communities, and perspectives, not only encompassing the non-human but predominantly celebrating the diverse and rich traditions upheld by non-Western people. Ecological awareness, practiced in myriad cultures, was overshadowed by colonial efforts and white supremacist ideologies that prioritized human voices at the top of a hierarchy. Without retellings from Indigenous and marginalized people, we also lose the true impact of the acts of genocide committed by colonial states. For example, without the stories of Indigenous residential school survivors on Turtle Island (North America, or in this case, Canada), the true cruelty of colonization and the acts of genocide committed against an estimated 150,000 Indigenous children in state-sanctioned residential schools would never have been recorded.⁹ Without counter narratives that challenge positive eurocentric storytelling, we as a society are not able to reflect upon our systems, acknowledge the pain caused by colonization, pay reparations, and heal. Additionally, without the stories of triumph and abundance from BIPOC communities, we would not be able to hope for a more just and equitable future. It is through radical multi-lens storytelling that we can build connections with each other and move towards decolonial action.

Decolonization: an Action

In understanding the concept of "museum" within our collective MOC and the use of storytelling as engagement, we strive to anchor our work in decolonial action. Much like Tuck and Yang in "Decolonization is Not A Metaphor", we believe decolonization works as actions that lead to the repatriation of Indigenous land, [...] life", and joy. This comes into stark contrast to how this term, along with other inclusionary terms (such as accessibility, equality, equity, etc), are often used in institutional policies to signal "inclusion". Many institutions claim they are making collective efforts to build diverse, inclusive, and welcoming environments, but upon further inspection it is often noted these same institutions have little to no BIPOC staff. Even when there are BIPOC staff, these institutions often hire those who think in their way, threaten staff questioning colonial institutional structures with reprimand or dismissal, or have an environment where

BIPOC have little autonomy.^{10, 11} Moreover, these policies are often followed by no concrete examples or figures of how effective or even how they are making their "decolonial and inclusive" efforts. This is why we believe that decolonization must manifest itself in tangible, visible actions that redistribute power to marginalized communities.

Decolonial action has many different appearances and methodologies, it is not only in forms of protest and violence so many of us are used to seeing it as. To see decolonization only through a lens of violence and carcerality does a disservice to revolutionaries who value the acts of joy, care, connection and love. Authors and activists, such as: bell hooks, Toni Morrison, Billy-Ray Belcourt, Bayo Akomolafe, Malcom Ferniand, and many more have all stressed to see decolonization as a practice of the everyday. It never is a solely individual process but always also appears as a collective experience. It exists in ways marginalized communities support each other and strive to understand one another. Experiences such as mutual aid, the creation of space for cultural practices, and the platforming of decolonial storytelling all work within the umbrella of decolonial action.

Creating decolonial experiences involves creating spaces for listening and understanding, rooted in openness and curiosity.¹² In the case of the MOC, through decolonial action, we strive to create experiences that aid in understanding colonization and the need for decolonization. Our work focuses on facilitating accessible unlearning and relearning that is "neither resolution nor stasis but a continuing process".¹³ As decolonial action is a complex space, we hold brave spaces for moments of healing and interconnection, as well as one for realization and disruption. To navigate this dichotomy of both realizing the brutality of colonization and healing, the MOC employs tools used by BIPOC communities to get through struggle: humor and satire.

Humor, satire, and ridicule have long been a powerful tool used by colonized people.¹⁴ In BIPOC communities there is a long history of using comedy to poke fun at colonial powers and gain societal status. In Mona Lisa Saloy's article "Still Laughing to Keep from Crying: Black Humor", she writes about how humor historically aided African Americans in withstanding and standing against racism. In games like "the dozens", "reading", or "Ikocha Nkocha" people are challenged to use wit to air out issues, critique poor social behavior, and defuse conflict nonviolently.¹⁵ Artists like Fela Kuti (Nigerian musician and activist) and Lapiro de Mbanga (Cameroonian musician) have long been using humor to critique colonial powers in their communities and challenge systemic oppression. The use of comedy in MOC's work serves a similar purpose, along with challenging colonialism, we hope to aid others to see decolonization work not as a burdensome task but as a fulfilling one that expands worldviews. It is through retelling history, platforming BIPOC

stories, and emphasising decolonial action the MOC builds our work. Our shared lens has been built and influenced by all activists doing this necessary decolonial work, and we hope that it has aided and inspired the readers as well. When it comes to decolonization in design, we leave with insights from our friend and professor, Andres Colmenares: “What if we design for healing, more than for solving? What if we cultivate relations, more than results? What if we aim for justice, more than for diversity? What if we repair and maintain, more than innovate and innovate? What if we choose harmony over progress? [...]What if we remember that we are verbs, more than nouns? [...] Remembering worlds as words dancing together. Worlds as ways of living”.¹⁶

LIVED EXPERIENCE AS RESEARCH: DETAILING AUTHOR'S PERSONAL STORIES OF COLONIZATION TO SITUATION OURSELVES TRANSPARENTLY

While we have stated MOC's personal lens, we believe it is important to share each member's personal lens and why we are motivated to pursue decolonial work. Though it can be common practice for designers to see themselves as a neutral and objective creator in their work, the MOC wants to challenge this belief by situating our members transparently. We believe each person understands the world and creates through their own personal lens, and it is this filter that dictates our actions. Personal factors such as birthplace, passport holdings, class, race, religion, ability, etc. ... deeply shape what we know and experience. These are the things that make us individuals and are what give humanity the beauty of difference, but they are also what close minds or create fear of different ways of being.

In this section, the MOC members will situate themselves to provide transparency in how and who does our work. By doing this, we are acknowledging that our work does not exist on its own, yet is shaped by the member's lived experience. We believe this is a radical way to be accountable and honest to our readers. By providing context of who we are, readers have the agency to adjust how they will understand and place value on our work. It allows folks to find a shared likeness but also holds the MOC's work accountable for experiences we might miss.

We also feel that this practice of situating is important as our team is based in Europe and we were raised in the European & North American context. While we are a team of individuals holding African, Asian, and European identities - we know that we have relative

privilege as people coming from an academic setting. Without stating these privileges and personal lenses, we feel that we would be doing a disservice to MOC's work and the work of other activists in decolonial communities.

Each creator wrote their own introduction and speaks of their experience in the third person and in their own tone of voice. Change of writer will be dictated by a brief name introduction, followed by their personal statement.

Carolina

Carolina is of mixed heritage, Portuguese and Angolan. She has been deeply marked by the tension between the narratives presented in the media, academic, and school settings, and her personal experience. She has been navigating the complexities of her blackness and privilege since birth, from the unkind and discriminatory actions, failing systems of meritocracy to the audacity and disrespect of patriarchy and classism. The exploitation is as clear, yet constantly unmentioned, in her background studies of biology where ecological imperialism justified the setting of capitalistic structures. After finding she upheld many harmful societal beliefs, she now celebrates her ancestry as a space of worthiness, joy, community and beauty. Unfortunately, due to war, there is not much we know of her Angolan family roots besides the spoken stories of her grandmother about their Kwanyama ancestry. This has heightened her love for African indigenous cultures, alternative ways of knowing, and highlighted the profound impact of colonization today.

Marielle

Marielle was born and raised on the unceded territories of x^wməθk^wəyəm, Skwxwú7mesh, and səliłwətaʔ on Turtle Island, otherwise known as Vancouver, Canada. They are a settler on that land from mixed Cantonese and German-Russian-Ukrainian Mennonite heritage. They grew up in a financially secure household, where they had access to learning and resources at an early age. Throughout their life, they have navigated academic and professional spaces through the lens of disability, advocating for themselves and accessible access. Close to their Cantonese heritage and thanks to their mentor, Godfrey Tang, they have spent years working for their ancestral settlement community of Vancouver Chinatown. Because of this, they are intimately familiar with the acts of human trafficking, indentured servitude, and assimilation that were forced upon their family and other marginalized groups by the colonial state of Canada.

Working as an activist, service designer, and performance artist, they have built close ties with the drag, 2SLGBTQIA+, and disability community and do their best to ensure these perspectives are included in their design work. They are deeply inspired by the work of their chosen kin and owe much of their understanding of decolonization to them, specifically their kin-from-another-multiverse: jaye simpson, an Oji-cree writer and performance artist of the Buffalo Clan with roots in Sapotaweyak and Skownan Cree Nation. They are ready and impatient for a world beyond colonization and capitalism - waiting for a time where community care, understanding, and love are prioritized.

Stella

Born and raised in Berlin, Stella's upbringing was shaped by the background of her German mother and Dutch father, with a family lineage rooted in Northern Europe. Growing up in a predominantly white and economically stable environment, she found herself immersed in a cultural milieu that obscured the nuanced realities of historical imperialism and the effects of colonisation. It was when she left her hometown to study in different contexts in Amsterdam and Barcelona that the diversity of lived realities came together in a way that was larger and more complex than the historical narratives of her educational and social upbringing. The previous justifications and silences that had once explained existing structures and systems no longer seemed comprehensive - certainly not valid. With this discomfort, her practice now involves a constant questioning of her positionality as well as her inherited privileges. For her, an active engagement with (de)coloniality means a commitment to learning, unlearning and relearning. Aiming to make a meaningful contribution to the creation of more diverse and just histories, it sometimes means keeping silent and simply listening.

THE CREATION OF THE MOC & OUR WORK: CREATING ACCESSIBLE EXPERIENCE TO LEARN

Our journey as the MOC began in Barcelona, Catalunya, as part of a 2022/2023 cohort in a master's program in designing for emergent futures. Each member was interested in imaging Non-Western Centric futures, and separately explored what this imagining meant. During our project work, we were tasked with forming groups through common interests and our wish to explore decolonization is what bonded us together. We wanted to study what it meant to take action and shape tomorrow for the global majority,

whose stories and futures had deliberately been disregarded for so long.

This connection is what marked the beginning of the MOC and our radical storytelling journey. The beginning of our work focused on building a foundation of trust, care, and understanding between us. Members spent time with each other to unpack our pasts and lenses, creating a connection that not only allows us to approach this work with openness and care but also with each other. Our shared bond and interests then materialized through creating small-scale projects that challenged our current colonial paradigms and capitalistic norms.

Prototyping the MOC

Our first creations were project deliverables, while the final two projects were integral components of our final Master's thesis. The initial projects were largely internal, and only shown within the masters, but all following work has been public, encouraging those outside the design industry to get involved. By the end of the summer of 2023, we had developed four prototypes and interventions that initiated dialogues about decolonizing futures and actively worked towards regenerative futures that we envisioned.

The Ticket Machine and the Button-Stamp, our two first creations, served as hands-on brainstorming of how and what the MOC was all about. It allowed us, in physical form, to experiment with how we can approach decolonization as a team and what is effective in getting people to engage in the topic. These projects relied greatly on the ideas of humor and equitable exchange, as we believe these are two key components of decolonial work. The details of each project are as follows:

Ticket Machine: A gumball-like ticket machine that asks viewers if they want to visit the Museum of Colonization or not. By clicking on the “yes” button, it will give out a small origami ball with a sticker containing “fun” facts about a colonial monument. The participant is then asked to go to the monument and place that sticker - as a way to get others to “come” to the MOC.

“That's soooooo colonial” Button-Stamp: This is a guerrilla graffiti stamp. When the user presses the button and stamps a surface, a speaker is activated that says: “That is soooooo colonial,” and the GPS location is added to a map that tracks all the colonial spaces you've encountered. Along with a digital print, the stamp leaves a physical print on the “thing” you stamped. The stamp is a [\[QR code 1\]](#) that allows the user to see the tagged locations of the different MOC spots.

Our last public projects were in an event-format: The Barcelona Walking Tour and a Kick-Off Party. They were designed to invite city walkers to learn more about their surroundings, as well as provide a shared experience with the community we have bonded with throughout the program. They were open and advertised to the public and allowed for anyone interested in engaging to sign up for the event. Each project prioritized connecting with others and fostering both a brave and safe space for folks to engage with the MOC and decolonial action. The details of each event are as follows:

Barcelona Walking Tour and Interactive Tour Guide: This sold-out tour revolves around Barcelona's colonial history and uncovering hidden narratives within its built environment. This brave space focused on engaging participants in the impact of colonization, to co-decolonize history, and share stories of marginalized communities. Participants receive a tour guide that provides information about the stops on the tour and where in it they could "wreck" or deconstruct the guide and reflect. The guide aided in fostering meaningful discussions, fun moments, and the imagination of a decolonial future - where by the end of the tour each participant created their own decolonial reflection.

MOC Kick-Off Party: This event featured current projects, dreams of decolonial futures, interactive activities, and connections with like-minded individuals committed to systemic change. The primary aim was to create a safe space for BIPoC community members and allies to enjoy the present, share experiences, and dreams. The event breathed life into MOC by fostering joy, creating moments of togetherness and community. It was a time to envision the future, contemplating questions like "What does love look like?" and "What would a decolonized public space look like?"

Laughter, hope, and radical love are the main tools in our work - as these have been the tools Black, Indigenous, PoC, Trans, and other marginalised groups have utilised to survive colonization and we believe these are the same tools that will allow us to create actions of decolonization. Our projects were a testament to these beliefs and aimed to provide not only a new way to understand colonization, but teach that decolonization is a fulfilling task that can lead to deep joy and interconnection.

Especially during the Walking Tour and Kick-Off party, we observed how deeply the MOC's lens on decolonization resonated with others. From other BIPoC folks to White-Europeans, many wanted to learn more, feel validated, and do better. During the Tour people opened up about the correlation between colonialism and the illegal drug market in South America, the tech industry and inner feelings of conflict, the struggles of black artists to be seen



beyond tokenism, and the heaviness and isolation often felt during decolonial discussions in other contexts. People of all backgrounds spoke about feeling unheard, confused, and/or hurt in these conversations, and appreciated having a space for validation and learning. By participating and MOC-ing the past together, we created a space for people to imagine alternative futures and bring them forth together.

Just as other decolonial thinkers have made their projects accessible to us, we hope to carry on this legacy of radical love and transparency by sharing the MOC projects and our learnings with others. The chaos of asking folks to engage in playful graffiti, the wrecking of conventional tourist tours and our perceived surroundings, the sparking of creativity and worthwhile conversations, the sharing nourishment and music while welcoming a diverse mix of people, the bursts of energy and warmth - all of these could not have been created without radical guidance from our communities.



IMAGE 2. MOC Walking Tour in the center of Barcelona (21.06.2023, Barcelona, Fab Lab Barcelona)

QR CODE. Discover the MOC [instagram here](#)



IMAGE 3. MOC Walking Tour in the center of Barcelona (21.06.2023, Barcelona, Fab Lab Barcelona)

IMAGE 4. MOC Walking Tour in the center of Barcelona (21.06.2023, Barcelona, Fab Lab Barcelona)

Personal reflection to decolonial action

To pay forward these teachings, the following paragraphs outline the framework we used to approach our work. Our hope is that it can help others in their own journeys unlearning and learning about colonization. As well as guide those interested in decolonial action, where they can start with internal work and what questions they can ask themselves to prepare. This is by no means an extensive list, but we hope as you engage in the work you can consider:

Learning about Your Personal Positionality

Begin by considering the political nature of the body. Starting with decolonial action requires acknowledging existence as inherently political and an examination of pre-existing beliefs and life experiences. This process shines light on privileges, the impacts of colonization and capitalism in lived experiences, and exposes uncomfortable histories and narratives within social circles. Reflect on the context in which you were raised. Identify stories that persist, causing harm either to yourself or others. Examine celebrated arguments that may conceal deeper truths. Uncover stories that were obscured behind dark lenses but are rich in resilience, wisdom, and love. This exercise is undoubtedly challenging, so ensure you have support while undertaking it. Once understanding your role in the world, we encourage you to be transparent with it when possible and practice developing positionality statements similar to what we have demonstrated in this paper.

For further information, refer to Eva Gonçalves's compelling example titled "Embargoed Memories" on Futuress for inspiration, the matrix of domination from Patricia Hill Collins, and writings on Intersectionality from Kimberlé Williams Crenshaw.

Inspecting Vocabulary and Storytelling in Your Environment

Observe, breathe, and sit with the words and visual records around you. Be critical and inspect what stories you hold as true and what has been told to you as unquestionable. Ask yourself why the environments are the way they are, who is benefiting and who is put at the disadvantage. What are actual truths and what has been omitted from your learning? Search out stories about your environment from BIPoC and marginalized perspectives, what have communities said about current structures that challenge or validate what you know and say? Along with the body, the paths we walk are not neutral and neither are our systems. These physical places tell centuries of stories about who was prioritized and who was left behind.

For further information, we recommend reading *The Dawn of Everything* by David Graeber and David Wengrow, *Care Work: Dreaming Disability Justice* by Leah Lakshmi Piepzna-Samarasinha, *All About*



Love by bell hooks, Decolonial Ecology by Malcom Ferdinand, and Braiding Sweet Grass by Robin Wall Kimmerer.

Deep Dive in Understanding and Connecting Narratives

Delve into research to understand the historical and cultural context of your surroundings. Investigate the stories behind symbols, monuments, and public spaces. Treat it like a puzzle; if you encounter a misfitting piece, consider it a valuable gateway to other stories, the sharpening of a critical lens. Diversify your sources by incorporating local histories, tales, myths, oral traditions, and the voices of marginalized communities, to better inform your understanding. By combining these insights and personal reflections you will map out a richer and more complex history, navigate complexity and uncertainty, and always seek kindness and caring practices. For instance, as mentioned earlier, MOC broadens its research and perspective through laughter and joy. You will find many connections between your current reality and its connection to the past, showing you the roots and the often rotten and twisted practices, framing a political and hyper-interconnected landscape. Be open.

For further information, research major issues within your location and find perspectives from those most affected and BIPOC community groups. This can look in the form of magazine articles, books, social media posts, etc. ... If you live in Barcelona, we encourage you to engage with groups such as: Top Manta, Radio Africa, Cooperativa Periferia Cimarronas or La Creatura; in Lisbon take a look at The Blacker the Berry Project, Coletivo Afrontosas, Hangar.CIA or Bazofa & Dentu Zona. If you are a regular in Berlin,

check out the Haus der Kulturen der Welt, reach out to SAVVY contemporary and to Creamcake.

Support & Contextualized Action

Learn about what decolonial work is being done in your community. Be transparent and write down why you engage in this work, and monitor how. If starting decolonial action, ensure that your process is well-documented, enabling you to share your findings with a broader audience. Opening up the knowledge you've gathered to the public not only amplifies its impact but also invites criticism, suggestions, and improvements. Your work is a small part of many others doing good work, it can also support the work of others and offer an enhanced perspective on how to make the sharing of this knowledge enjoyable, engaging, profound, relatable, and inspiring. This may involve talking to people, forming a collective, creating a card game, proposing a talk to an art center, or painting a mural. Dive into your passions and connect them with your newfound knowledge, inviting people in and embracing diverse voices. It is important to remember, for folks wanting to be allies to BIPOC folks, that if you take decolonial action seriously, to advocate and give up power to BIPOC leaders. It is not speaking for them, but providing resource and decision making powers in often exclusionary spaces.

For further information, we recommend Decolonizing Design by Dori Tunstall and Design Justice by Sasha Costanza-Choc, and the article "Dr. Bayo Akomolafe on Slowing Down in Urgent Times" by ATMOS.

IMAGE 5. Reading circle at the MOC-Walking Tour in Barcelona (21.06.2023, Cathedral of Barcelona, MOC)



CALLS FOR ACCOMPLICES: MOC'S PRESENT, DREAMS FOR THE FUTURE, & GETTING INVOLVED

Through this article, we hope we have inspired many to do further research into colonization's global impact and how one can aid decolonial work. Our work thus far only focuses on providing deeper context and engaging in alternative storytelling methods: by all means, this is just the beginning stages of what decolonial action looks like. While our methodology may expand in the future, we encourage readers to look at the decolonial actions taken by community members. More importantly, to engage with the writings from the leaders we note within our work, seeking out their work outside of the MOC's interpretation of their work. We also urge you to understand, we are one small collective out of many doing the work within Europe and the globe, that it is important to look at how other BIPOC define Decolonization and the actions it entails.

As for the future of the Museum of Colonization, we are currently looking for accomplices and allies to aid us in continuing this work in the future. That being said, while this project has captivated the interest of many and brought immense joy, the MOC members are currently on a hiatus to nurture our other passions, gain more experience, and save energy for this important work. This break serves as

IMAGE 6. MOCing together at the Kick-Off Party in Barcelona (16.06.2023, Hort del Clot Barcelona, MOC)

IMAGE 7. MOCing together at the Kick-Off Party in Barcelona (16.06.2023, Hort del Clot Barcelona, MOC)



a valuable time for personal growth and exploration, allowing each member to pursue and discover new skills that can expand our knowledge as individuals and as a collective. Our perspective on rest is one of revolution, promoting its right and embracing it, but also recognizing it as a huge privilege.

When the time is right, we will be back, to contribute to this collective journey. Our team located in Barcelona, Lisbon, and Berlin are eager to be reunited in this work, hopefully in the future as a way to sustain ourselves and decolonial action. By sharing this, we hope to be transparent and encourage others interested in supporting or joining the MOC to connect with us. We are eager to know of other accomplices in decolonization, and encourage those interested to send us an email at museumofcolonization@gmail.com or reach out to us on digital platforms. From simple inquiries, clarifying questions, offers of support, critical feedback, or just simple connecting, our team is excited to learn perspectives and opportunities for interconnection.

In all that is happening in the world, the MOC team continues to dream of cities that speak the truth, hold space for every voice, are transparent about their actions, and are more attuned to the stories of those who endure systemic harm. We aspire to intentionally open space for these voices and take meaningful actions in response to change oppression systems, by always rooting ourselves in loud laughter and actions of love. We dream of a day where the world is free from colonial oppression and where the innovations that are platformed connect us through understanding and love. Until the next artifact, tour, or exhibition the MOC team wishes you all the best in your journeys of decolonization.

The Manifesto of Phyto-centred Design

On adjusting the design compass and thinking beyond the human

By Laura Drouet and Olivier Lacrouts from d-o-t-s

In its traditional understanding and practice, design is a discipline dedicated to the satisfaction of human needs: Designers intervene in the world and modify it to accommodate our own wishes. The climate crisis, however, has revealed that focusing solely on our species' desires has had – and keeps having – nefarious consequences on the environments we co-inhabit with other living beings and the quality of the relationships we establish with them. Moreover, being inherently connected to industrial production and the capitalist economy, design carries with it an original sin: extractivism, consumerism and waste are embedded in its DNA. Its effects are deep and long lasting.

Questioning and reframing design's goals and approaches appears therefore to be a necessity. Acting with-in the world – that is acknowledging and supporting relationships with other species too – must become the discipline's new mantra and direct the compass going forward. As researchers and curators active in the design field, we strive to be part of that effort and keep reminding ourselves of the responsibility we have in cultivating a critical perspective on what surrounds us and the way in which the discipline responds to that. In 2020, we started a multi-year curatorial endeavour (consisting of a touring exhibition, a book and a manifesto) that aims at raising awareness about plants, and proposes to reconsider design as a fertile practice that takes into account necessities and desires beyond the human.

WHY CAN'T WE SEE PLANTS?

Silent and motionless, in the eyes of most people, trees, shrubs, annual and perennial plants simply form pleasant landscapes whose presence we generally take for granted. We tend to regard them as mere environments and surroundings, as if their sole purpose was to be the still background in front of which our dynamic lives can quickly flow.

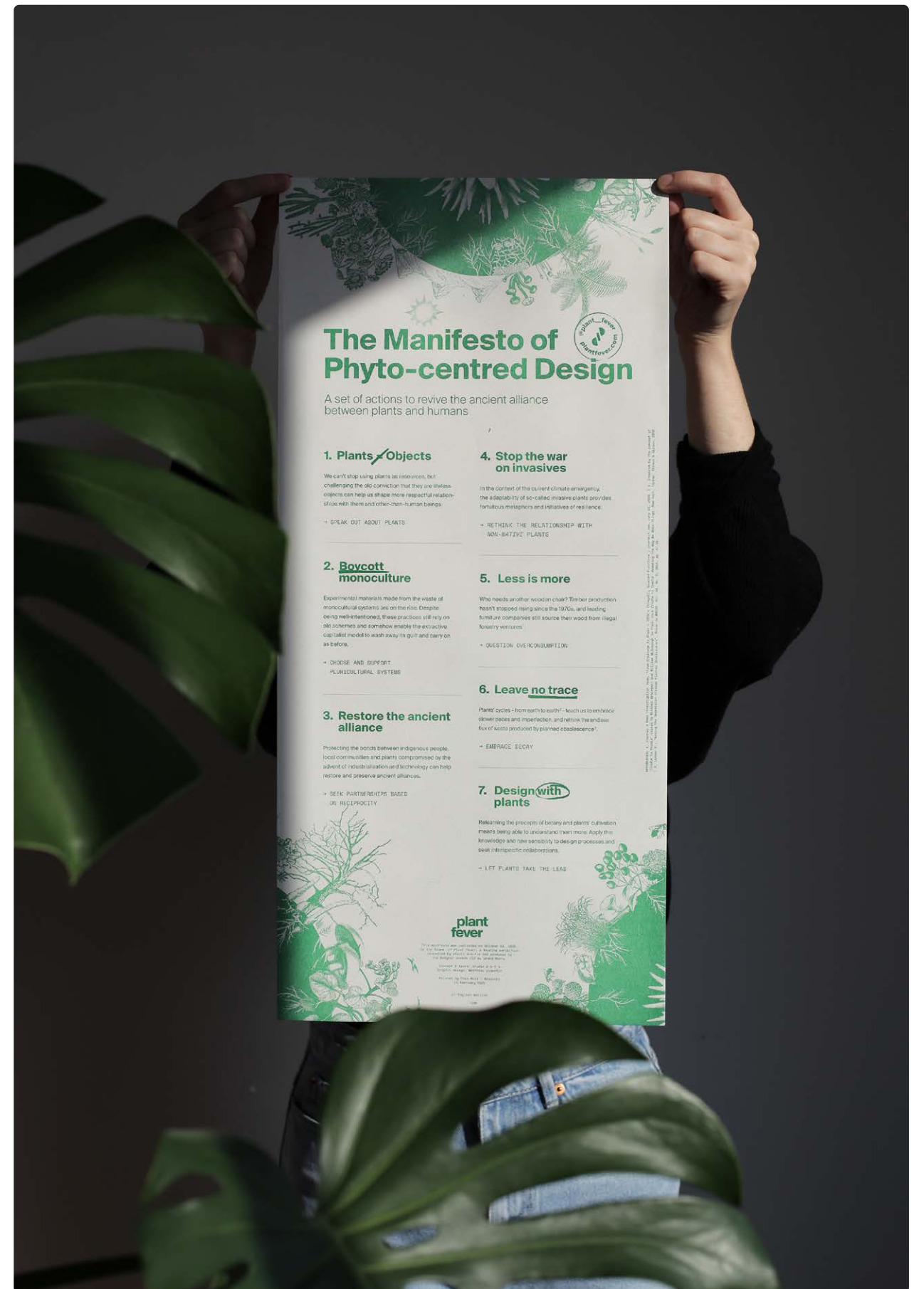
A short walk in a forest is probably the best way to get a sense of the little attention we pay to them (unless, of course, you are a botanist² or are taking a nature therapy class). Immersed amidst diverse vegetation, how many plants are you able to recognise and name? How much do you know about their life and the way they communicate with one another (and other non-plant species)? How long will it take for your eyes to be distracted by moving beings like a squirrel jumping from branch to branch or a robin flying over your head?

Coined in 1998 by American botanists and professors Elisabeth E. Schussler and James H. Wandersee, the term 'plant blindness' can be defined as the inability to see the vegetal world. Schussler and Wandersee explained this condition as the result of the limits of our visual perception, which selects only the "relevant".³ Other scientists and philosophers⁴ have claimed that plant blindness can be considered rather as a mainly Western cultural phenomenon that has its roots in Ancient Greek and Christian understanding of the world: a world in which plants rank just above lifeless minerals.⁵

SHIFTING PERSPECTIVE

And yet the vegetal realm accounts for 99.5% of the Earth's visible biomass⁶ and is far from being passive. On the contrary, plants inhabit, create and design the planet⁷ as sentient living beings. A fact that, back in 1905, had already stunned Austro-Hungarian botanist Raoul H. Francé (1874-1943), who, after pondering the possibility that plants might have sensations, wrote: "How much pain and sorrow we must daily inflict on nature!".⁸ More recently, while contemplating his garden, American journalist Michael Pollan, too,

IMAGE 1. The Manifesto of Phyto-centred Design (2020, Brussels, photo Olly Cruise © d-o-t-s).



couldn't help but notice that: "all these plants, which I'd always regarded as the objects of my desire, were also, I realized, subjects, acting on me, getting me to do things for them [...]."⁹

If the notion of subjectivity¹⁰ applied to the vegetal world might surprise several people in Western countries, it should be noted that many Indigenous communities embed this view in their cultures and cultivate reciprocal alliances with plants.¹¹ Inviting us to reconsider our place in a world that we cohabit with other species, thinkers such as Potawatomi botanist Robin Wall Kimmerer emphasise the importance of noticing plants as this "acknowledges that we have something to learn from intelligences other than our own." "Listening, standing witness," Wall Kimmerer claims, "creates an openness to the world in which the boundaries between us can dissolve in a raindrop."¹² Advocating relationships with non-human beings based on gratitude, she exhorts us to see plants as teachers. Her thoughts, together with those of others – such as the researcher Monica Gagliano, the biologist Stefano Mancuso, the philosopher Michael Marder and the botanist Francis Hallé – have profoundly inspired the spreading of new fields of studies around the planet – from Australia to Italy and Canada. At the core of these emerging theories are a series of original concepts – such as the much-debated plant intelligence¹³ – that are shaking Western society's sense of order.

Several ethnobotanists, anthropologists, paleobotanists, scientists and historians have also brought to light the complex relationships that exist between the vegetal world, humans and other species, revealing stories of connection and interdependence,¹⁴ empowerment and resilience,¹⁵ enslavement and exploitation.¹⁶ Their findings add a new layer of understanding to past and present global issues – such as (de)colonisation, climate change and overconsumption – and help question unilateral narrations formulated by dominant white male elites.

As it subverts centuries of human-centred beliefs and behaviours, the work of all these researchers is paving the way to a shift of perspective: a shift that feels particularly timely and needed, and that the whole design industry should embrace without hesitation.

APPLYING A GREEN FILTER

Embedded in our capitalist society, design has, in fact, a role to play in welcoming and supporting alternative narratives. It is its duty to sow seeds of inclusiveness instead of domination and to seek novel approaches instead of relying on old schemes that have already been proven wrong.

In the context of a globalised economy mainly based on extractive methods, the scarce consideration we have for plants has conveniently allowed our consumerist culture to view them as simple commodities¹⁷ whose availability – as objects that we can freely modify, harvest, eat, burn, displace, cut, control – we take for granted. Applying a green filter to design – that is, considering also the health and needs of the vegetal realm beside ours – can help us identify and rethink damaging practices such as monocultural production processes and the patenting of ancestral knowledge and Nature.¹⁸ This effort makes all the more sense when we consider that design-related industries – like furniture making and fashion¹⁹ – rely heavily on plants' productivity to prosper but are generally responsible for major habitat loss of both vegetal and animal communities (humans included).

The current climate crisis is a potent reminder that all living beings are strongly interconnected. Making sure that positive interspecific connections are encouraged and strengthened is thus essential to the survival of all of us.²⁰

A DOMESTIC ENDEAVOUR

As more and more people move away from rural contexts to live in cities,²¹ one of the environments that might offer the most promising possibilities of exploration of new design scenarios for the cohabitation between humans and plants is the domestic one.

Well-adapted to our warm interiors, specimens such as ferns, orchids and *Monstera deliciosa* have been introduced in our homes as decorative objects ever since exotic plants became available in Europe – following the numerous expeditions of European explorers and the advent of colonialism.²² Used to soften the too-hard angles of modern buildings and fairs' ephemeral booths – or as functional elements that allow the "landscape element to come indoors"²³ – plants have turned into the protagonists of what we could describe as a 'plant fever' which affects mainly urban dwellers who live distanced from nature.²⁴ Indicators of this contagious desire for green companions, hashtags like #PlantsMakePeopleHappy and #PlantParenthood have become ubiquitous on Instagram and other social media platforms.

While the environmental impact of the international horticultural and cut flower markets continues to grow to meet such fever (with stories of violated human rights being regularly reported),²⁵ the widespread infatuation for plants also manifests an increasing need to connect with other forms of life and is accompanied by a genuine curiosity to learn more about them.



Acting as quiet reminders of other-than-human existence, plants call for our attention beyond the decorative role that has been assigned to them. It is precisely in that regard that design can give us the tools to reach out to them, facilitating the understanding of their otherness.

TOWARDS A PLANT-CONSCIOUS DESIGN

As witnesses of their time, a growing number of creatives are indeed responding to this burgeoning thirst for greenery and plant-conscious lifestyle. Concerned with the effects of the pressing climate crisis and inspired by recent scientific discoveries and philosophical theories, designers, engineers, biologists and artists are looking at the

plant world with renewed curiosity in search of resilient alternatives. They work as individuals and collectives or as groups of professionals with various backgrounds. The panoramic field of vision offered by their transdisciplinary journeys calls into question not only the ambient hyper-specialisation but also the boundaries drawn between living beings – humans and non-humans. The paths and conclusions of their wanderings are varied, but all of them should be taken into account as serious suggestions for questioning the status quo.

Several creatives are looking for new ways of using the leftovers of monospecific production systems;²⁶ some are (re)discovering the importance of protecting native crops and local knowhow;²⁷ others are questioning the role of invasives. While some explore ways to reconnect us with plants through scents,²⁸ others encourage us to grow our own vegetables²⁹ and even objects.³⁰ Finally, a few aim at solving [often human-made] plants' problems³¹ while others seek for interspecies relationships through technology by creating new sophisticated devices³².

One might argue that most of these initiatives remain profoundly human-centred (one of the main goals being the postponement of the collapse of the world

IMAGE 2 & 3. *The Manifesto of Phyto-centred Design* (2020, Brussels, photo Olly Cruise © d-o-t-s).

as we know it). Nevertheless, these endeavours have the merit of opening the way to a more vegetal and collaborative approach to design that shall benefit all beings instead of leaving some behind. By helping to “stage livable futures for both plants and people”³³ – to use the words of Canadian professor Natasha Myers – they can be seen as a way to thwart centuries of extractive and subjugating practices.

THE MANIFESTO OF PHYTO-CENTRED DESIGN

Inspired by the projects of these (and many other) contemporary international designers, engineers, and artists – as well as by the thoughts of the above-mentioned philosophers, anthropologists, scientists and authors – The Manifesto of Phyto-centred Design was conceived as a tool for change, an attempt to raise awareness of a deeply interspecies approach to design, one that sees plants as allies instead of objects: a phyto-centred design (the prefix phyto-coming from phutón, meaning “plant” in Ancient Greek). The seven plant-conscious reflections and invitations that compose the manifesto are not addressed solely to practitioners, but call for everyone’s – including producers’ and consumers’ – sense of respect, responsibility, equity and empathy towards plants. They should be read not as rules but as propositions to see the world through the perspective of vegetal beings. So that we can “recognise the permanent state of our fragility, our mortality and our finitude”³⁴ – to adopt the words of American philosopher and professor Donna Haraway – and stay alert and develop new resilient schemes that, like plants, can adapt. The aim is to stimulate new encounters, different behaviours, novel narratives and further investigations.

1. Plants ≠ objects

We can’t stop using plants as resources, but challenging the old conviction that they are lifeless objects can help us shape more respectful relationships with them and other-than-human beings. → Speak out about plants

2. Boycott monoculture

Experimental materials made from the waste of monocultural systems are on the rise. Despite being well-intentioned, these practices still rely on old schemes and somehow enable the extractive capitalist model to wash away its guilt and carry on as before. → Choose and support pluricultural systems

3. Restore the ancient alliance

Protecting the bonds between Indigenous people, local communities and plants compromised by the advent of industrialisation and technology can help restore and preserve ancient alliances.
→ Seek partnerships based on reciprocity

4. Stop the war on invasives

In the context of the current climate emergency, the adaptability of so-called invasive plants provides fortuitous metaphors and initiatives of resilience.
→ Rethink the relationship with non-native plants

5. Less is more

Who needs another wooden chair? Timber production hasn’t stopped rising since the 1970s, and leading furniture companies still source their wood from illegal forestry ventures.³⁵ → Question overconsumption

6. Leave no trace

Plants’ cycles – from earth to earth³⁶ – teach us to embrace slower paces and imperfection, and rethink the endless flux of waste produced by planned obsolescence.³⁷ → Embrace decay

7. Design with plants

Relearning the precepts of botany and plants’ cultivation means being able to understand them more. Apply this knowledge and new sensibility to design processes and seek interspecific collaborations. → Let plants take the lead

Authors’ note: this essay is an adaptation of texts originally published as part of the book *Plant Fever. Towards a Phyto-centred Design*, edited by d-o-t-s [Laura Drouet, Olivier Lacrouts].³⁸



IMAGE 4. *The Manifesto of Phyto-centred Design* (2020, Brussels, photo Olly Cruise © d-o-t-s).

From heartland to healing:

Designs cultivating rejuvenation



CHAPTER 4.

In the vast expanse of our existence, there exists a sacred space known as the heartland—the beating core of our collective spirit, a reservoir of resilience and sanctuary. As we embark on a journey through the pages we delve into the profound connection between the landscapes of our environments and the designs that shape our well-being.

This chapter serves as the gateway to a transformative exploration, inviting you to ponder the intricate tapestry woven by the interplay of our innermost emotions and the spaces we inhabit. Here, we lay the groundwork for an expedition into the realms of holistic design, seeking to understand how intentional and thoughtful creations can serve as catalysts for healing, restoration, connectedness, and renewal.

As we navigate this narrative, we will encounter stories of communities rediscovering their heartlands—those sacred spaces that resonate with their deepest aspirations and traditions. We will witness the convergence of design innovation, sustainable practices, and cultural sensitivity, all harmonizing to bring about a renaissance in how we conceive and construct our living environments.

Unveiling the Stigmas around Mental Health that Are Living in Our Data

Mental health & AI

By Alex Johnstone and Pau Aleikum from Domestic Data Streamers

Each one of us has a personal story with our mental health. We inherit some things, and other aspects are defined by the experiences we've lived through. According to the World Health Organization (WHO), approximately 1 in 4 people in the world will be affected by a mental or neurological disorder at some point in their lives.¹ Despite this prevalence, many people are afraid to seek help, in part because a diagnosis can often feel like a label that comes with a huge social stigma attached.

Think of classic films like "One Flew Over the Cuckoo's Nest" or iconic characters like Norman Bates in "Psycho." These narratives often portray individuals with mental health conditions as dangerous, unpredictable, or even monstrous. The horror genre, in particular, has a penchant for equating mental illness with malevolence, as seen in characters who reside in or escape from psychiatric hospitals only to wreak havoc. Even well-intentioned portrayals can falter, slipping into the realm of caricature rather than capturing the nuance and humanity of mental disorders. Shows like "13 Reasons Why," despite intending to start conversations around mental health, have garnered criticism for potentially harmful depictions.

CULTURED MACHINES

It's important to recognise that popular culture significantly shapes these biases that are inherent in AI systems. These systems don't watch movies or TV, but they do "learn" from the data we feed them — which includes the words, images, and ideas circulating in our media. As a result, these deeply ingrained cultural stigmas find their way into the algorithms, reinforcing and perpetuating harmful stereotypes. In our experiment, the AI-generated images were not created in a vacuum; they are a reflection of the biases present in the datasets the

machine was trained on. The machine simply mirrors collective opinion, including the stigmas perpetuated by popular culture. In essence, our pop culture has been scripting the algorithms all along, making it doubly crucial for us to confront and challenge these narratives.

It was in this context that we embarked on a research experiment in partnership with Lundbeck, a pharmaceutical company specialised in brain diseases. We transformed their communications campaign into an investigation using AI to better recognise the social stigmas that exist around mental health. We prompted an image generator to produce typical scenes from daily life, with and without the presence of mental disorders, for example, a woman in a party with depression, or a teacher with schizophrenia giving a class. We could then compare and analyse the differences between the two images to identify specific presumptions about each mental disorder that are written into our shared data footprint.

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WHAT WE LEARNED

In the example of the teacher, we can observe that without the mention of mental health in the prompt, the teacher is presented as calm, and in control as he stands over his class in a dominant position. Meanwhile, the second image presents our teacher as unstable, a dazed expression across his face, and his confusion seems to be spreading to his students as if his condition were something contagious. The contrast is stark, and based on this evidence we can objectively name the stigma and affirm that people with schizophrenia are perceived as unstable, unpredictable and liable to negatively affect those around them. We ran the same experiment with different mental health conditions such as depression and bipolar

disorder, in both professional and domestic settings. Below we see the results of a prompt that described a person playing with their child, and in the second image we added that this parent had bipolar disorder. From comparing these two images we could name yet another clear stigma, namely, that people with bipolar disorder are unstable and cannot care for others. In further testing, we also observed that people with depression are seen to spread their mood to the people around them, and that they don't make enough effort to get better.

The objective of this research was to use our critical approach towards AI to encourage reflection and conversation around mental health stigmas, and visualise an issue that all too often goes unchallenged because of its hidden nature. If we can clearly identify a stigma there is the chance to unite in combating it, and to be more aware of when we might be perpetuating the problem.

To give the viewer a sense of the kind of language that was producing these images, we asked them to also guess at which words had been used as a prompt for certain images. This also allowed them to recognise an awareness of their own latent preconceptions.

Can you guess what we might have prompted for the following image?

The simple prompt: "A man with schizophrenia cooking dinner" was enough to elicit this gruesome scenario.

After visualising the situation, it was also important for us to be able to offer our audience steps to act on this new awareness. We wanted to see how AI could help us to imagine what a more supportive and progressive perception of mental health might look like. Using these creative tools, we encouraged participants to get inspired and think up more desirable future scenarios, and ways in which we could combat prejudice together.

IMAGE 1 & 2. AI generated images responding to the prompts of a schoolteacher with and without schizophrenia (2023, Barcelona, Domestic Data Streamers)

us to imagine what a more supportive and progressive perception of mental health might look like. Using these creative tools, we encouraged participants to get inspired and think up more desirable future scenarios, and ways in which we could combat prejudice together.



CAN AI HELP TO BREAK DOWN STIGMAS?

AI generated images act as a mirror to our own society and collective opinions. We are the ones feeding these machines with our ideas. This presents us with a totally groundbreaking opportunity to objectively observe stigmas we all perpetuate, without the barrier of blame and responsibility.

Labeling others with a stigma is rarely a conscious choice. From our very earliest, most simple interactions, we are being socialised to align ourselves with certain assumptions that have been built up and reaffirmed over generations. To break these collective prejudices implies a great deal of personal risk and independent will, and that means slow progress. It is incredibly difficult to take personal responsibility for culturally ingrained bias, and of course there is the fear that you will be vilified for judging others. This is where AI presents a powerful tool for us to rethink society in an objective way, without the blame that can provoke an unproductive, defensive response in many people. At Domestic Data Streamers we are pouring hours into critical investigation of the potential human benefits of AI. Rather than assuming the best use for this tech is to make us more efficient at what we already do, it could offer a powerful self-critique that can help us to challenge long standing problems in society and painfully-predictable cycles in human interaction. When we see bias as a feature rather than a failure of these machines, there is a sudden explosion of possible uses that could be explored

WHAT CAN WE DO?

The purpose of this research isn't merely to gaze at our navels and bask in newfound self-awareness. No, we've got work to do. It begins with questioning your own thinking. Engage in conversations that challenge rather than confirm your views. Share resources, like articles and educational videos, that offer a counter-narrative to the stigmas we've internalised. And the next time you see a stigmatising portrayal of mental health in the media, don't just roll your eyes, speak up. Your voice could be the ripple that turns into a wave of change.

AI could help us to become more inclusive, considerate and responsible as a society, especially if we can

IMAGE 3 & 4. AI generated images responding the prompts of a woman playing with a baby, with and without schizophrenia (2023, Barcelona, Domestic Data Streamers)

IMAGE 5. We often focus on how AI is trained on biased data, but rarely ponder on how these systems train us, shaping our decision-making processes. (Barcelona, Domestic Data Streamers)

understand the potential value in reverse engineering the technology. When we assess the possibilities of this technology we cannot think of it as we typically do when we look at the latest new invention. This is not a car designed to move us around faster and more safely. Or a phone that connects us over long distances. This is a mirror, and as such it is rooted in our own identity. This is not something external, but an opportunity to learn more about ourselves through working backwards to understand why we see the reflection we do.

WHY WE MUST REMAIN CRITICAL

We often think of artificial intelligence as this neutral entity, a digital tabula rasa that we mould with data and algorithms. But in truth, the mirror is two-sided: just as we transfer our inherent biases onto these machine-learning models, they, in turn, reflect these biases back onto us. This isn't merely an echo; it's a transformation, subtly shifting our perspectives in ways we aren't even aware of.

A recent paper by Laura Matute and Lucía Vicente highlights how biases in AI can persist in human decision-making long after the interaction with the machine has ended.[2] We often focus on how AI is trained on biased data, but rarely ponder on how these systems train us, shaping our decision-making processes. This gives rise to a new kind of coevolution, where humans and machines learn from each other in a loop.

One question that looms large is: can we ever break free from this cycle of bias? The democratisation of AI development might be a step in the right direction. Inviting a diverse set of developers and users to critique and perfect these systems can introduce checks and balances. But as with any societal issue, there are no easy fixes. Remember, the next time you interact with a machine-learning model, the gaze is mutual — you're not just training it but also training you.

Authors' note: This essay is an adaptation of texts originally published as part of the Medium journals of Domestic Data Streamers on the limits and potential of GEN-AI.[3]



“Rain” Watchers

Have you seen the rain? Have you watched the rain?

Project team

littlefishtino:
Tino/Tianao Yu
(they/them)

Organization

littlefishtino [QR code 1], in
collaboration with Dutch
mental health institution
GGzE

Location

Eindhoven,
the Netherlands - Europe

Project type

Outdoor installations,
Social design, Design
research, mental health
innovation, Community,
process, system

PROJECT DESCRIPTION

Inspired by sensation seeking and started from embodied research, project “Rain” Watchers is a semi-permanent outdoor space with designed installations where people can connect with the essence of rain, transcending mere observation and engaging all their senses. In intimate gatherings that bring together a diverse mix of community members—including mental health care clients and staff, as well as the public—participants connect through sharing their personal experiences and stories.

Developed in close partnership with long-standing Dutch mental health institution GGzE, the project not only extends an open invitation for people to embark on a novel journey of discovering nature as a therapeutic environment but also demonstrates a methodology for how designers can create convivial relationships with institutions and mental health. After the rain or in any weather, being there and taking a rest, nature is sure to surprise.

CONTEXT AND HISTORY

“Rain” Watchers is the second chapter of the Nature Beyond Language program. Around March 2022, I found myself in the darkest period of my life. Frustrated by a year-long waiting list for mental health care, in desperation, I began to lie down and look up. Through observing the movements of trees and clouds, I rediscovered a long-lost sense of peace and happiness. I really wished to share it with others. After learning and consulting with multiple psychologists and testing the exercise with friends, I created a caring and inclusive set of instructions, giving rise to the “Nature Beyond Language” program. With support from GGzE, this exercise has been practiced with diverse groups, including mental health care clients, employees, and citizens, garnering very positive and touching feedback.

The question arose in my mind: “What do we do when it rains?” Some participants also asked me. Living in the frequently rainy Netherlands, what is the next exercise to be designed, and the next story to be told? I started to search for the answers from the beginning of 2023.



WHAT IS THE NEED IT TACKLES?

Mental Health Care in the Netherlands (and many other places)

Most psychotherapies are language-based, even for some alternative ones. When using language, brains are constantly receiving, reflecting, and calculating. It can also generate barriers or stress. For those seeking mental health help, navigating through layers of screening and enduring potentially lengthy waiting lists can be an additional challenge.

With this project, my aim is to offer individuals a reprieve—a moment to rest and enjoy the magical natural stimulations, with minimal reliance on language. The exercises provided can be practiced together as a way to connect with others but also just by themselves. It functions akin to both nutritional prevention and emergency pills, providing a unique approach to mental well-being. The constant, unpredictable, and pleasant motion serves to stimulate focus, encourages living in the moment, and offers a practice in letting go of control.

Where is nature?

Some nature therapies have been approved as beneficial and sustainable, such as Shinrin-Yoku (forest bathing). These therapies often require “high-quality” nature. However, there is a common frustration expressed: “There is not much real nature in the Netherlands. Everything is manmade.”

Through the simple act of looking up, individuals can witness fewer man-made objects and more of the ever-present, always-moving nature. “Rain” Watchers is more than the rain.

IMAGE 1. A collage of rain watching and some visitors during DDW 2023. (2023, Eindhoven, Tino)

Where is nature?

In the Netherlands, rain is something “special”, evoking mixed feelings among people. During a few hot summer days, many may relish and even crave the rain. However, the cold, wet, and prolonged rainy periods can be unpleasant and inconvenient, triggering annoyance, fear, sadness, anger, or even depression, despite its lack of physical danger. Many individuals tend to minimize their time in the rain. The rain, as an important part of nature, sometimes is seen as a hindrance to connecting with nature.

Through creating novel and beautiful experiences, this project tries to foster a more positive emotional connection with rain.



WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Following a presentation on Nature Beyond Language during Dutch Design Week 2022's mental health seminar, individuals from GGzE were moved by the story and expressed a willingness to collaborate on the "rain project." In early 2023, alongside GGzE's green advisor Rob Lammers and gardener/activity supervisor Peter Klomp, both believers in the power of nature, we started a journey of exploration and exchange of ideas through nearly weekly meetings.

Challenging myself to be in the rain many times, initially was very difficult and yet necessary: I found inspiration in the unique experience of viewing the world through my glasses during rainfall. This led me to decide on a focus: watching the rain—an almost transparent, invisible ingredient. Through embodied research, dreamy experiences previously unnoticed emerged, resulting in two documentary research videos.

Crafting numerous models became a crucial step to enhance the rain-watching experience—making it not only beautiful but, importantly, intriguing enough to captivate attention for an extended duration. Feedback was collected from various sources. Conversations with psychotherapists further enriched insights into potential applications of the project.

By April, the project's focus shifted from installations to building a dedicated space. Walking through De Grote Beek with Peter to find a suitable location on this big land, finally we connected with a spot where the energy felt right, and suddenly it rained for a few minutes. Rob managed all the administrative tasks, and we got the location.

Handcrafted installations and sculptures repurposed from wasted materials became a focal point, with plexiglass, originally used during COVID-19, forming



the installation's ceiling. Heated by hand, it assumed organic shapes, influencing the flow of rainwater. Adjusting the height and angle of a discarded airport bench allowed people to sit and gaze upwards. Special plants were strategically planted, contributing to sound and touch experiences. Many volunteers came to help with the construction.

From June 2023, I began sharing experiences and stories with various groups within GGzE's network, also exploring possibilities with research centers. Rain-watching meditation videos also were created and shared through different events. During Dutch Design Week 2023, global visitors came to experience it. We had many beautiful conversations.

The space and the stories are still evolving, and they will always be. It's also a long healing journey for myself.

IMAGE 2. The space and the installation (2023, Eindhoven, Tino)

IMAGE 3. After the rain, water remains on the ceiling, and shines with the sun (2023, Eindhoven, Tino)

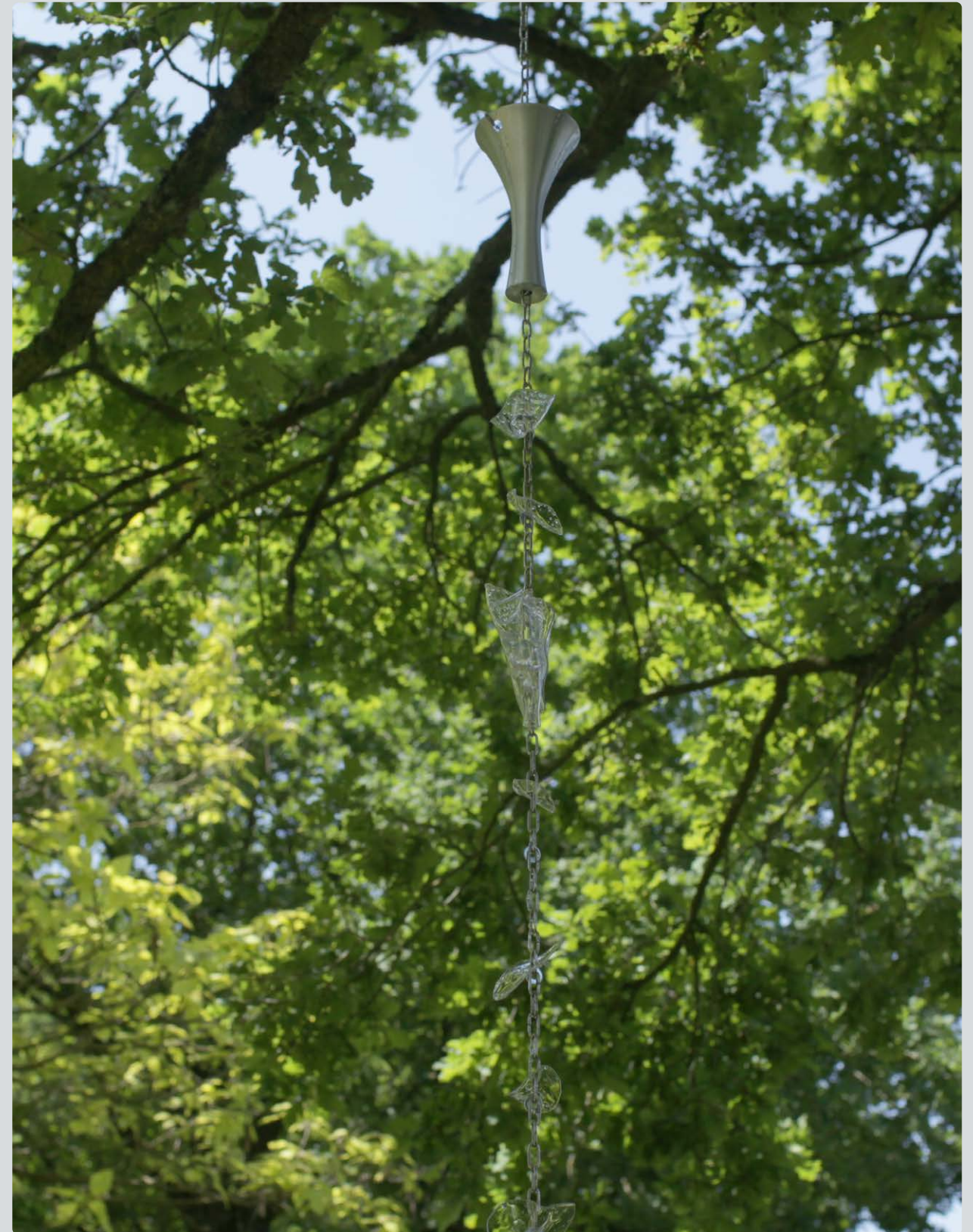


IMAGE 4. One of the sculptures made with wasted material. It interacts with the rain (like a rain chain) and the wind (2023, Eindhoven, Tino)

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

With a history spanning about 200 years, GGzE serves over 17,000 clients annually, standing as one of the largest mental health institutes in the Netherlands. A long time ago, De Grote Beek was a space for people who were not considered “normal” in society. Now it’s the headquarters of GGzE, a transitional living space for about 400 clients, and a green area open to all citizens.

On the grounds of De Grote Beek, we’ve constructed a semi-permanent space that goes beyond the romantic notion of “a place in the world just for people to experience the rain, even watch it.” It serves as a catalyst for reflection, standing as a manifesto about nature and mental health. “Is it normal to watch the rain? Should we watch the rain and the trees? Why? Can we also listen to the leaves or smell the soil there? Or actually, anywhere?”

Through guided tours and meditation sessions, we’ve shared experiences and stories with over 200 participants, including many receiving current mental health care, and professionals in the mental health care industry. Some researchers have expressed interest, and I am working on collaboration to research and work on implementing this project in the future.

The most rewarding impact for me is witnessing people enjoy it. Recently, I heard a story of a man who, after having a conversation with us, returned to sit in the pouring rain.

Some words from participants of this project I would love to share with you: “It’s like watching the cloud” —“I felt water choose its own way, that also helps me find rest in not having water in control” —“I love to talk to people, and I want to talk with people. That was the first moment that I have the peace in me. So I was in my own inner space.” — “At one point, I just feel surrender to nature, then I feel free.”

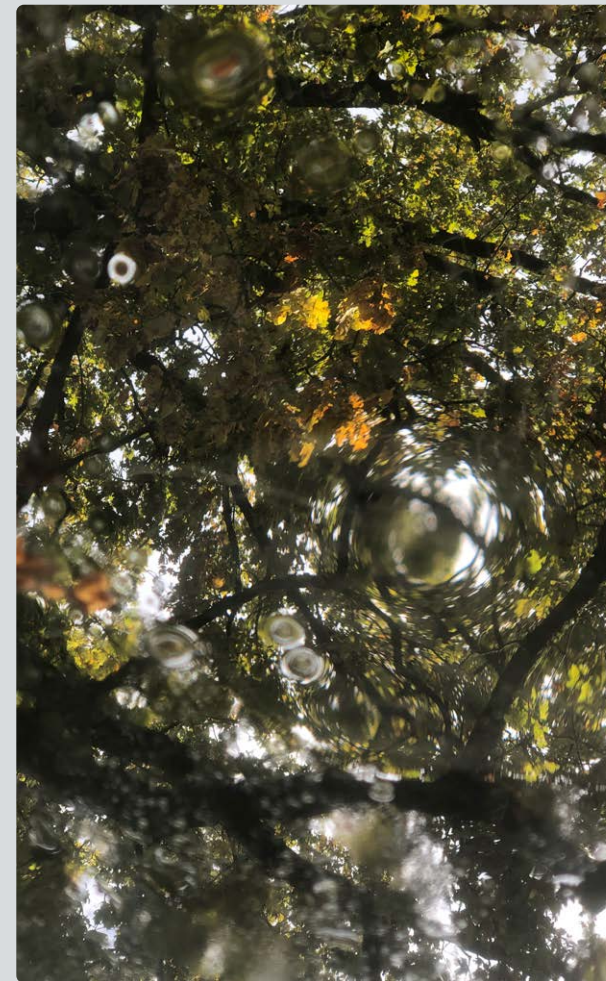
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IMAGE 5. During an event of GGzE, many citizens and clients joined the rain meditation session (2023, Eindhoven, Tino)



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Handcrafted installations and sculptures repurposed from wasted materials became a focal point, with plexiglass, originally used during COVID-19, forming

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

The project initially took on a semi-permanent physical form in the Netherlands and was experimented with by the local community. In October 2023, Dutch Design Week drew a global audience expressing appreciation with valuable feedback. Besides the guided tour at the location, there was also an indoor exhibition.

IMAGE 6. During an event of GGzE, many citizens and clients joined the rain meditation session (2023, Eindhoven, Tino)

IMAGE 7. Poster used for the space and events. There is also a Dutch version. (2023, Eindhoven, Tino)

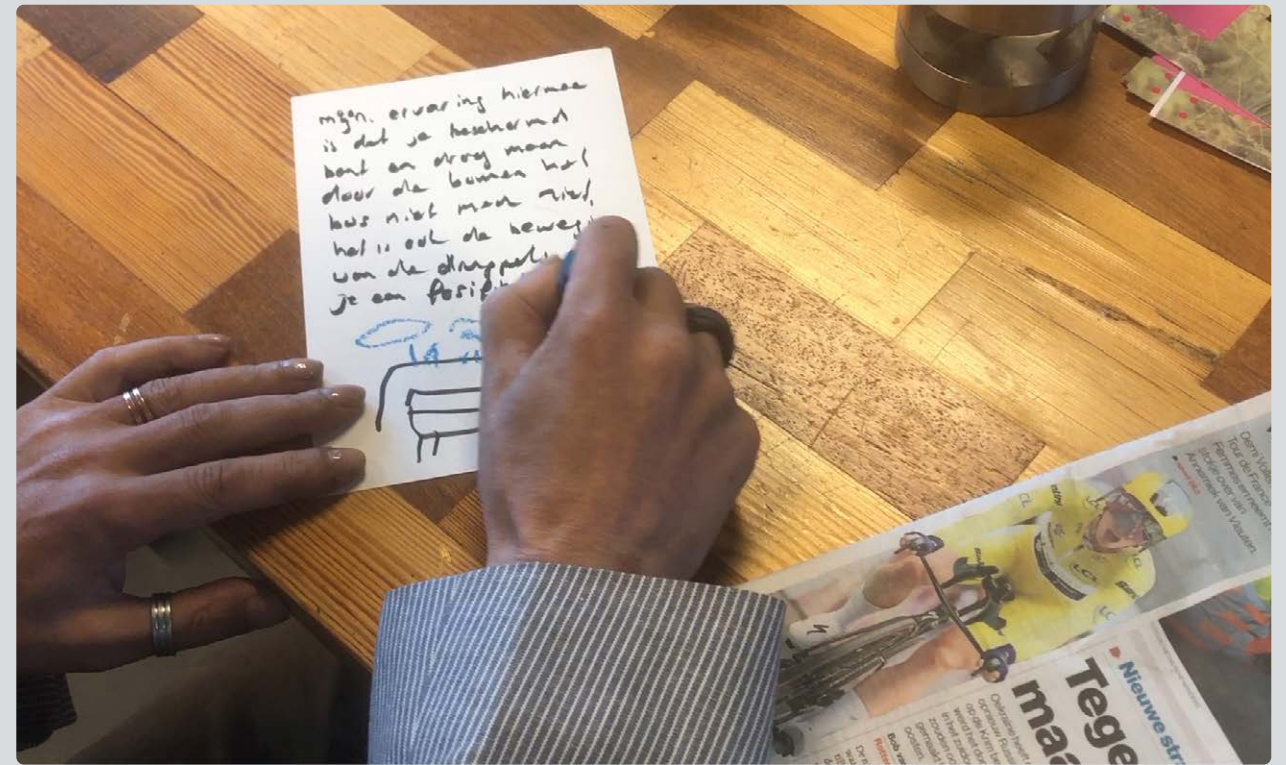
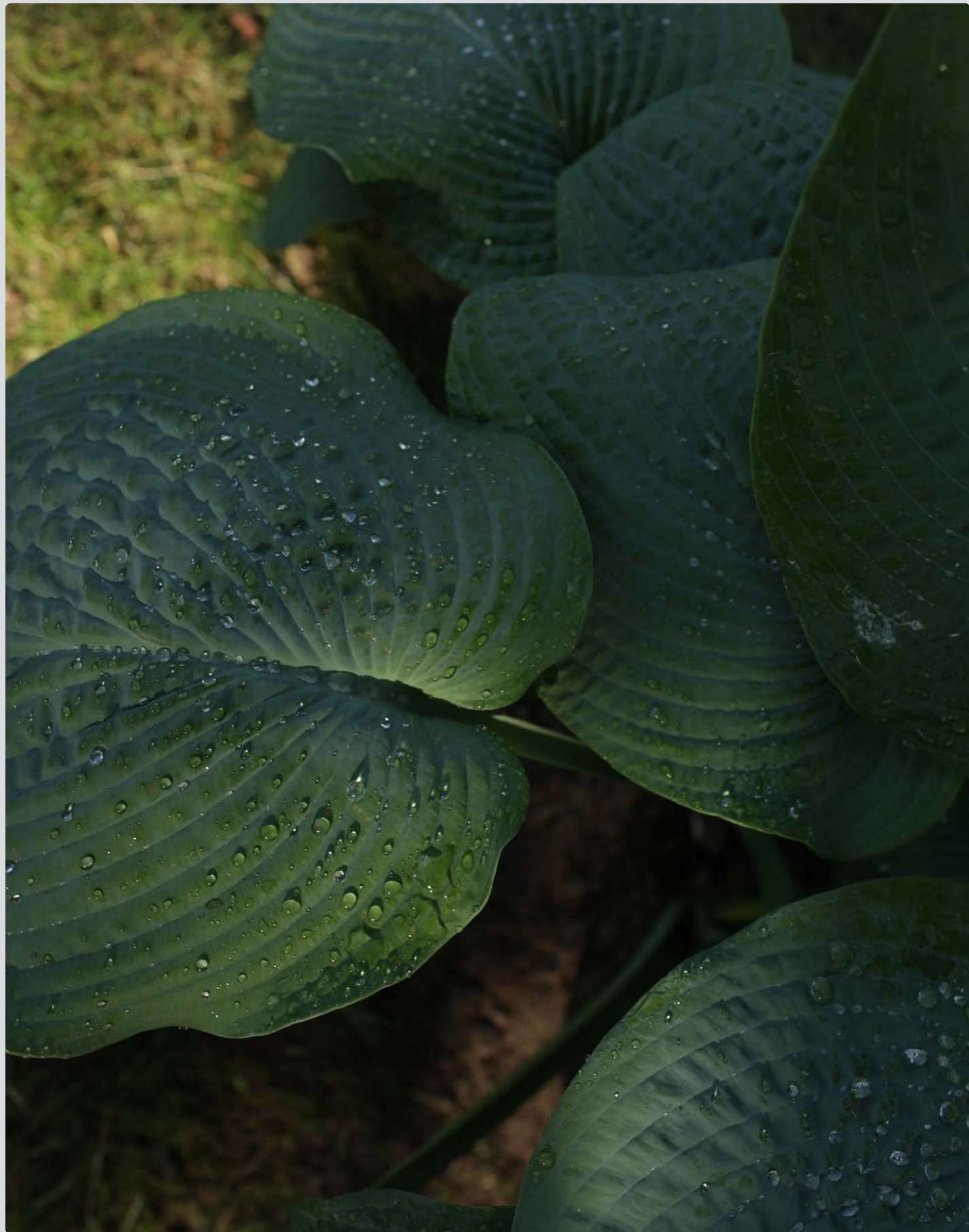


IMAGE 8. The big-leaf plant has a very special sound when rain drops on it (2023, Eindhoven, Tino)

IMAGE 9. A client who is temporarily living at GGzE to receive was writing their feelings and making drawings after the experience. (2023, Eindhoven, Tino)

QR CODE. Explore more about the littlefishino organisation [here](#)



The "Rain" in the project name implies that it's more than just about the rain. I hope the simple approach and magical experience of watching the transparent nature ingredient—the rain—can inspire people to explore nature as a healing environment anywhere and anytime.

The essence of the project allows, mirroring nature, its story to be shared in diverse forms, from the Netherlands to the world, and from the mental health industry to everyone.

WHY IS "RAIN" WATCHERS DISTRIBUTED DESIGN?

This project originated from my personal psychological struggles and unfolded over six months of embodied research. Together with mental health care clients, employees, and citizens, who are also users of the project, we co-created an inclusive space where diverse narratives converge, fostering a sense of belonging for people. This collective dialogue on mental health contributes to a deeper societal understanding and support. The space, stories and the community are ever-evolving.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

I want to invite some people who feel like they want some extra company and happiness. We will go near the clouds, make tea and dance together.

Responsive Open Source Modular Housing Prototype | #ROSHOP

Sharing architectural prototyping and refugee innovation knowledge using GitHub

Project team

Vuga William, Ira Emmanuel, Gama Richard, Gilbert Charles, Doreen Bazio, Timm Wille, Richard Maliamungu, Stephen Kovats, Peter Treuheit. Words by Caroline Shukuru Patrick

Organization

Youth Empowerment Foundation (YEF), r0g_agency

Location

Pagirinya Refugee Settlement, Uganda - Africa

Project type

Process, Architecture

PROJECT DESCRIPTION

#ROSHOP [\[QR code 1\]](#) is a Responsive Open Source Modular Housing Prototype—a collaborative, media-inspired modular house designed specifically for complex post-conflict and politically unstable environments. It provides evidence of resourcefulness within refugee communities, utilising local materials and open-source media tools for learning and documentation. It is a fusion between architecture and media. #ROSHOP was selected for participation at the International Media Architecture Biennale 2021.

What makes #ROSHOP unique is that: a) #ROSHOP is a sustainable and culturally relevant building made using a vernacular architecture that involves local materials and indigenous techniques, and b) the building process involves a collaborative approach and knowledge sharing using open source digital technologies such as Github. It can be planned and coordinated 100% online by teams in multiple locations globally. The first iteration of #ROSHOP is at the Pagirinya Refugee Settlement, called the Pagirinya Satellite House.

CONTEXT AND HISTORY

Pagirinya Refugee Settlement in northern Uganda near the town of Adjumani is home to Youth Empowerment Foundation (YEF), a South Sudanese refugee organisation supporting local communities with various forms of skills development, providing access to information and engaging in peacebuilding efforts which include trauma relief and mitigating online incitement to violence. With these efforts to educate and empower, YEF needed a physical space to conduct its activities.



In the framework of the #ASKnet media and community hub development programme initiated by r0g_agency for open culture and critical transformation in collaboration with South Sudanese open tech and refugee youth innovators, YEF engaged in an experimental project to create easy-to-build modular housing modules in 2020.

WHAT IS THE NEED IT TACKLES?

Since 2018, YEF continuously faced the challenge of finding suitable spaces for youth to gather, learn, and exchange ideas. They often met under a tree or in an inadequate classroom with a carpet roof at the Pagirinya secondary school, only to be chased out for higher priority meetings. This long standing problem of inadequate spaces for youth was the driver to exploring alternative ways to build, create, and document spaces.

Pagirinya Refugee Settlement houses more than 32,000 refugees¹ from South Sudan. Started in 2016, it has become a place where people from various backgrounds unite to establish a sense of community. For YEF, actualizing the Pagirinya Satellite House was more than just getting a house. It was about creating a Social Network Space (SNS) that facilitates and fosters the expression of open ideas for knowledge and experience sharing that support effective peace education, reconciliation and social mobilisation of South Sudanese youth and Ugandan host communities.

IMAGE 1. Beginning of a LibreOffice workshop in the Pagirinya Satellite House (15 Nov 2021, Pagirinya, Vuga William)

IMAGE 2. The Pagirinya Satellite House - first successful iteration of #ROSHOP (05 Dec 2023, Pagirinya, Caroline Patrick)

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

The planning of the Pagirinya Satellite House began in 2020, led by YEF's Director, Vuga William. Amidst the Covid-19 pandemic, the team saw an opportunity to develop scenarios for constructing better-ventilated spaces sans electricity, laying emphasis on digital collaboration and media documentation. It was an experimental project to see whether the team in Pagirinya could actually learn how to build a house with these qualities and using these processes, and the result was a house and a Github repository. The housing prototype became a fusion of architecture and media.

Peter Treuheit, known for socially responsible housing in Africa, was brought in as the advising architect on the project. Based in British Columbia, Canada, Peter was 11 hours behind and had never been to Pagirinya. On the ground, Alumai Patrick, a local engineer, advised William on what materials could be suitable for building. Community members carried water to the site, dug the foundation, and raised the walls. From Berlin, Germany, Stephen Kovats and Timm Wille provided media and technical support and from Ottawa, Canada, a group of PhD students from Carleton University lent a hand in architecture photography, filming and Github workshops. The entire house was planned, designed, and built with these teams being 100 percent remote. They maintained regular communication via Telegram and Big Blue Button.

Architecture

The design of the house was based on adapting known, traditional or context relevant visual and aesthetic components, with new forms or solutions for common building practice and functionality. The team brainstormed around vital design aspects such as ventilation, natural light, and sustainable materials. How can they incorporate cultural aspects and local architecture designs? Architect Francis Kéré's work laid as a guide for the team to explore this question. They debated the screen door elements from the award winning architect, a round tukul building shape with a cooling thatched roof traditional to the refugee community, and a rectangular pavilion shape with a slanted roof from modern Ugandan architecture.

These elements were explored not only for their aesthetics but for their materiality. Research went into building techniques that are sustainable and native to the region. Rammed earth technology appeared as an innovative and sustainable construction approach for the pavilion wall. Traditionally, burnt bricks are used to build walls in Pagirinya, which means cutting down trees to burn the bricks. Rammed earth technology requires no bricks or trees, and can be used with material already local to Pagirinya. It involves casting a mould, layering and ramming a mixture of several soils and cement, similar to a thick layered cake.

Media

The media aspect lies in creating compelling digital documentation that moves beyond complex text and technical jargon, to better communicate the methodologies involved in the housing prototypes. It was a process that went hand in hand with the building process and was not simply just observation. Team members actively participated in the building process, capturing notes and snapshots in real-time and uploaded them to Github, a familiar code hosting website.



IMAGE 3. Pouring a soil mix into the rammed earth mould (12 Apr 2021, Pagirinya, Vuga William)

IMAGE 4. Final rammed earth wall showing layers of rammed soil (05 Dec 2023, Pagirinya, Caroline Patrick)

It was an immersive approach that ensured that every crucial step was logged, creating a comprehensive narrative of the building journey. Their objective was to create an open-source guide, a blueprint for potential rebuilding opportunities. The team uploaded files with detailed construction procedures and accompanying photos. This dynamic archive acted as a bridge, connecting the on-ground team in Pagirinya with remote collaborators in Germany and Canada. At the end of the construction, the project had a fully detailed Github repository [\[QR code 1\]](#) that they could share with other communities in similar circumstances to reproduce or further develop the prototype for their own use.

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

Since its completion, the Pagirinya Satellite House functioned as an educational centre, hosting diverse learning initiatives. As a Covid response, YEF partnered with the humanitarian organisation, Field Ready, to manufacture face masks that were distributed to the entire settlement. YEF continues its work empowering the youth in Pagirinya by providing LibreOffice training, email and social media proficiency, safe internet use courses, women's empowerment activities, and child marriage awareness among other structured educational programs.

Residents expressed gratitude for having a space they could call their own, a place where their needs were heard and accommodated. For some, it provided a conducive environment for education, with one resident expressing joy in being able to complete a software engineering course there. The building's cool interior, in contrast to Pagirinya's heat, is a natural refuge for concentration and learning. Both the local government and partner organisations like UNHCR recognise the value of having such a house in the refugee community.

The journey towards #ROSHOP is synonymous with the journey towards the Pagirinya Satellite House—an innovative building solution proving impactful in post-conflict and politically unstable environments. It is a viable and impactful solution to the critical need for suitable spaces in refugee settlements. Replicating this initiative in other areas holds the promise of transforming lives and fostering empowerment in communities facing similar challenges.



IMAGE 5. Close-up detail of thatched roof (05 Dec 2023, Pagirinya, Caroline Patrick)



IMAGE 6. Interior of the house, a combination of the tukul and the pavilion (05 Dec 2023, Pagirinya, Caroline Patrick)

IMAGE 7. Exterior of the house, a combination of the tukul and the pavilion (05 Dec 2023, Pagirinya, Caroline Patrick)

QR CODE. Explore the ROSHOP project here



WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

Technologies such as rammed earth have existed for thousands of years, but are often replaced by environmentally damaging techniques such as burnt bricks. Rammed earth structures use local materials, meaning they have low embodied energy and produce little waste². In some cases, returning to these basic techniques seems crucial to the development of regions where the effects of climate change are most felt.

The project adopted vernacular architecture, focusing on the material and techniques local to the region and that are environmentally conscious. It shows that it is possible to take small action locally, with limited resources, and still have considerable impact on the climate fight.

WHY IS #ROSHOP DISTRIBUTED DESIGN?

The most important outcome of the project is the Github repository, an open-source guide and blueprint for potential rebuilding opportunities. Teams building the prototypes learn valuable media and digital skills with which they can connect with peers and experts around the world to create new and efficient building typologies in extremely challenging environments.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

I would have dinner with my late grandfather, Lekinda Kessy. He lived in Moshi, Tanzania under the foothills of Mount Kilimanjaro in a small hut that he built himself after World War II. The hut still stands.

Distributed Food Factory

Distributed Design for the Circularity of Local Food Systems

By Massimo Bianchini, Lorenzo Silvestri, Luca Grosso, Laura Cipriani, and Stefano Maffei from Polifactory, Department of Design, Politecnico di Milano

INTRODUCTION

Distributed Food Factory is an experimental initiative conceived and developed in 2023/2024 by Polifactory, the makerspace of the Politecnico di Milano. The project explores the potential of distributed design for local food systems through the design and prototyping of open-source solutions dedicated to urban social farming, monitoring the biodiversity of urban ecosystems, and domestic food fermentation.

Understanding the concept of food (eco)systems and related innovation challenges

More than ever, reasoning and acting on food in a systemic dimension are vital for various reasons, ranging from people's health to the future of the planet.

Nutrition is a critical component of human health. Eating is a biological necessity and an essential socio-cultural practice, but the current food system is making people and the planet sick: the impact of the food system affects most of the United Nations Sustainable Development Goals (SDGs). More than 820 million people do not have enough to eat, and many consume inadequate diets that substantially increase obesity and diet-related non-communicable diseases¹.

A systemic approach considers the relationship between contemporary dietary patterns and access to healthy and sustainable foods, both in quantity and quality. Considering and managing food chains in their complexity – from production to consumption to the valorisation of by-products and waste – allows for an effective response to the challenges of food security and the prevention of food waste, with environmental and ethical benefits.

The production and consumption of food have a tremendous impact on the use of natural resources and the reduction of biodiversity². At the same time, food systems also have a significant economic and

social impact on local communities, both in rural and urban areas³. Understanding the interconnections between food practices, human communities, and ecosystems is crucial for promoting factions and solutions that work towards the circularity of food systems⁴. Another theme to address with a systemic approach concerns the globalization and interculturality of food. Understanding how global dynamics influence local food habits (and vice versa) is crucial for addressing issues related to equity and food justice.⁵

Finally, "on top of" everything is the relationship between climate change and the sustainability of food systems. Food systems are actively involved in climate change through greenhouse gas emissions or deforestation and, at the same time, suffer its devastating effects. The development of circular food systems is the obligatory path to break this "vicious circle," regenerate natural resources, and attempt to preserve the planet for future generations.

But exactly, what is a food system today? The FAO defines a food system as a "...complex network of actors, processes, and relationships dealing with the production, transformation, marketing, and consumption of food in a specific geographic region (...). Food Systems (FS) encompass the entire range of interconnected actors and their activities that add value to the production, aggregation, transformation, distribution, consumption, and disposal of food products from agriculture, forestry, or fishing, as well as parts of the broader economic, social, and natural environments in which they are embedded..."⁶. With the term "food system" or "food ecosystem", we refer to an interconnected and self-sustainable system that involves the production, distribution, and consumption of food at the regional level. The primary goal of a food (eco)system⁷ is to promote the production and consumption of food locally, reducing dependence

IMAGE 1. The 3ee Project (2024, Polifactory - Politecnico di Milano, open licence)





on global supply chains and supporting the local community in terms of economy, environment, and well-being. Food ecosystems encourage circular production, food diversity, and direct interaction between producers and consumers (as well as their direct involvement), contributing to greater awareness of the origin and quality of the consumed food.

In Europe, the development of open, distributed, and circular innovation processes for food systems is primarily guided by the Farm to Fork Strategy⁸, which promotes the ecological transition of agri-food systems. Supporting this strategy is the New European Bauhaus, which advocates a blend of design-design innovation, technological innovation, and social innovation to stimulate the transformation of food systems, with particular attention to urban contexts. Innovating for food (eco)systems means pragmatically addressing some significant challenges that require strategic solutions⁹:

- **Technological accessibility and reduction of the digital divide in food systems.** The adoption of advanced enabling technologies, such as digital agriculture and artificial intelligence, and the disparity in access to digital technologies among local communities pose a major innovation challenge for food systems¹⁰. Innovating in this realm involves envisioning solutions that work for monitoring and tracing food resources, productions, and products within food systems. This includes enhancing food security, safeguarding, restoring, and increasing the biodiversity of food ecosystems, and devising solutions to make precision agriculture more open and inclusive.

- **Circular transition in food systems.** The need to reduce the environmental impact of agriculture and food production is a key challenge. This requires the adoption of sustainable agricultural practices, efficient water resource management, reduction of food waste, and the implementation of low-impact production models. Circular processes in food transformation, preservation, and consumption involve solutions for digital fabrication-enabled food processing, new forms of alternative manufacturing, sustainable conservation and storage practices, and innovative waste management strategies.
- **Changes in food behaviors and social inclusivity of food systems.** Consumer choices are evolving, with an increasing demand for healthier, sustainable, and transparent foods. Simultaneously, there is a rise in inequalities in access to food resources. Addressing these challenges requires the ability to develop solutions that facilitate access to food systems for disadvantaged groups. This involves rethinking food redistribution and donation processes, innovating food experiences, and enhancing food education to make them more sustainable and conscientious.

IMAGE 2. The Circle Fermenter project (2024, Polifactory - Politecnico di Milano, open licence)



The potential of Distributed Design for innovating food systems locally

Design, particularly Distributed Design, can contribute to the circular innovation of food systems by offering a collaborative and accessible approach that engages natural, human, and technological resources.

Distributed Design encourages technological innovation through the sharing of knowledge, data, and information. This can lead to the development of technologically advanced tools, such as monitoring sensors, automation systems, and detection devices, enhancing the efficiency and sustainability of food systems, especially at the local level. It is well-known that the open-source approach makes projects more accessible, facilitating broader dissemination and adoption within local communities. Additionally, it breaks down economic barriers associated with the design and implementation of technological solutions. Development costs can be reduced, and local communities can benefit from solutions suitable for their financial resources.

Distributed design is characterized by its activation and dialogue with a broad community of designers, developers, and experts, allowing for global participation in designing solutions for local food systems. On one hand, this characteristic promotes user and local community-centered design processes,

leading to the development of solutions tailored (or adaptable) to the needs and specificities of the community. On the other hand, it fosters the sharing of know-how and skills, contributing to the formation of local communities of practice that are more capable of connecting globally and more aware and prepared to tackle systemic projects.

Distributed Food Factory. Experimenting Distributed Design in local food systems.

Starting with an understanding of the Food Ecosystem concept and exploring the potential contributions of Distributed Design to this theme, Polifactory (1) - the makerspace of the Politecnico di Milano - conceived and developed the Distributed Food Factory project. The six-month experimental initiative (September 2023 - February 2024) delves into the connection between Distributed Design and Food Ecosystems at the local level. Distributed Design aims to design innovative open-source solutions that promote the circular transition of local food ecosystems, integrating the principles of the "Farm to Fork" strategy with those of Distributed Design. Distributed Food Factory explores the development of product services, processes, and systemic solutions that enable individuals and organisations to track and monitor food ecosystems at both the "macro" level (fields, gardens, parts of forests, rivers, or lakes) and the "micro" level, where food transformations are facilitated by microorganisms (bacteria, fungi, etc.). This initiative involved collaboration between

IMAGE 3. The Circle Fermenter project (2024, Polifactory - Politecnico di Milano, open licence)

Polifactory and a group of fourteen young designers (students and recent graduates at the School of Design, Politecnico di Milano) whose project proposals for the Distributed Food Factory open call were selected for their alignment with the principles and values of Distributed Design and their innovative approach to local food systems.

Distributed Food Factory supported the design and prototyping of two projects - [Open Farmer Kit](#) and [3ee](#), which operate at the "macro" scale of food ecosystems, and [Circle Fermenter](#), which focuses on the "micro" scale.

[Open Farmer Kit](#) explores the theme of Local Food Ecosystems at the "macro" level by proposing an open-source and modular station for monitoring environmental parameters and biodiversity in social farming ecosystems. Originating from the master thesis of Valentino Stella, the project was collectively developed with Lorenzo Silvestri, Matteo Mojoli, and Davide Formenti. Designed for urban social agriculture, particularly in publicly owned medium to large-sized gardens and orchards managed by citizens, Open Farmer Kit aims to transfer the benefits of precision agriculture devices to small-scale urban agricultural systems. It seeks to facilitate the transition to agricultural practices influenced by open and citizen science models, characterised by autonomous management logic independent of external inputs, capable of maximising biodiversity in cultivated areas.

Simultaneously, if adopted in various urban garden contexts, Open Farmer Kit offers municipalities the opportunity to create a monitoring network for biodiversity and the health of distributed agricultural ecosystems throughout the urban area. This product-service system explores sustainable production models and promotes innovative connections between various stakeholders, fostering collaboration between FabLabs, municipal authorities, urban farmers, and citizens. In this way, the project strategically aligns with practical approaches where design solutions, based on circularity and Distributed Design principles, manifest as tools capable of generating data and knowledge useful to local communities.

Open Farmer Kit is conceived as a technically advanced system for monitoring urban agricultural ecosystems, semi-automated yet simple and intuitive for user engagement. The kit's modules can measure, analyze, and transmit data related to various environmental parameters indicative of the health status of the monitored areas. These include air quality measurements by particulate levels, key soil parameters such as moisture, pH, nitrogen, phosphorus, and potassium levels, and the presence and tracking of pollinator insects through image acquisition. Designed to be as autonomous as possible and harness renewable energy sources, the system can flexibly operate where data sampling is



IMAGE 4. The Open Farmer Kit project (2024, Polifactory - Politecnico di Milano, open licence)

IMAGE 5. The Open Farmer Kit project (2024, Polifactory - Politecnico di Milano, open licence)



IMAGE 6. The Open Farmer Kit project (2024, Polifactory - Politecnico di Milano, open licence)

required from different areas of interest. Open Farmer Kit is assembled using readily available electronic components for environmental parameter detection (microprocessors, sensors, and batteries), materials, and technologies found in Fab Labs (especially 3D printing and laser cutting). Its cost-effectiveness (approximately 1000 euros per kit) facilitates adoption in local contexts.

3ee project proposes an advanced urban biodiversity monitoring system based on acoustic technologies capable of identifying and classifying pollinator species present in a local ecosystem such as a field, garden, park, or urban forest. The project, developed by Martina Comola, Cemre Ercan, Chiara Guarino, Valerio Libardo, and Andrea Somenzi, focuses on experimenting with Liquid Deposition Modeling (LDM) fabrication technologies to create bug hotels that can serve the dual purpose of monitoring microfauna and contributing to its sustenance. The electronic components used to trace and acquire insect sound frequencies integrate with the bug hotel structure, which includes multiple "micro spaces" designed to accommodate different pollinator species and promote moss growth within humidity niches. 3ee project aims to create microsystems that facilitate the cohabitation of various animal and plant species. The decision to use the LDM digital fabrication process (3D clay printer) is aimed at employing environmentally friendly materials suitable for constructing devices highly compatible with living organisms. In addition to these aspects, the 3ee system is characterized by considerable flexibility, both regarding the types of pollinators to accommodate (managed through a specific and customizable access system to the bug hotel based on the species of interest) and its integration with other open-source monitoring systems like Open Farmer Kit.

The final project Circle Fermenter explores the "micro" scale and the domestic dimension of food ecosystems. The open-source solution by Arianna Bosco, Matteo Cappellari, Vincenzo Cassano, Elena Gasparri, and Qianhuai Zeng consists of a modular fermenter that offers the opportunity to experiment with sustainable approaches to food transformations, characterized by forms of micro and self-production. The use of metabolic processes of fungal organisms employed in the production of fermented foods, such as koji, adds new active agents to food production systems. A scenario is created where the self-production of food depends on advanced and technologically enabled forms of collaboration between humans and living microorganisms. Circle Fermenter combines digital fabrication technologies with those related to the responsible control component of microorganism growth parameters. The project stands out for its strong participatory and experiential user component, simultaneously promoting the dissemination of low environmental impact food production models. These models are independent of intensive decentralized

production logics, while also raising awareness among end consumers about the importance of correct food models for the well-being and health of individuals." The projects developed within the Distributed Food Factory initiative stimulate a broader reflection on some aspects related to the relationship between Distributed Design and the innovation challenges for food systems.

The first reflection concerns the development of solutions that connect the imperceptible and invisible dimensions of food systems. The projects encourage users to observe and understand not only the context for which they are designed but also the roles and interconnections that arise among the different actors involved in a local food system. Connecting macro and micro dimensions means linking, through product-service solutions, what is not (completely) perceptible in its systemic dimension (resources, organizations, places, people) with what is not observable to the naked eye (microorganisms).

The second reflection concerns access to food systems. The three projects, considered as a whole, explore democratized forms of access to systemic production and food transformation processes. This means enabling various categories of subjects, but at the same time, it means beginning to reflect on broader themes such as the relationship between food and intersectionality¹¹ or the emerging concept of food justice¹².

The third reflection concerns the development of solutions that (post)humanize the relationship with food systems. The developed projects explore some applications of digital technologies that enable new forms of relationship and collaboration between humans and food systems, with their natural and artificial resources.

The final reflection concerns the development of "modular and distributed technological and product infrastructures" to support the circularity of local food systems. The three projects were conceived with principles of combinability, replicability, and scalability, considering solutions that can be applied and implemented locally in a granular manner. This promotes the creation of local networks that can break down barriers to accessing circular practices applied to food systems.

IMAGE 7. The 3ee Project (2024, Polifactory - Politecnico di Milano, open licence)

IMAGE 8. The 3ee Project (2024, Polifactory - Politecnico di Milano, open licence)



Nyári, the Summer Kitchen

An experimental project reinterpreting the traditional rural smokehouse for modern needs

Project team

Veronika Róza Háló,
Murczin Evelin

Organization

Moholy-Nagy University
of Art and Design (Master
degree project)

Location

Máriahalom, Hungary -
Europe

Project type

Community, space,
design and participatory
construction process

PROJECT DESCRIPTION

Nyári is a 21st-century summer kitchen, an open, covered space designed to bring a group of like-minded people around a fire to bond with nature and each other while preparing and sharing a feast. The vision behind the design and organisation of a participatory building process was provoked by the realisation that communities without a common place to be struggle to stay connected. By organising a series of 'weekend building camps' for our community, we have been able to observe the impact of creating together and find out over the years whether the collaborative, hands-on learning experience of placemaking fulfils its purpose and brings the people back together from time to time.

CONTEXT AND HISTORY

Nyári was designed and built as part of our master's degree project in architecture. As we approached the end of our studies, we began to notice how the once family-like communities formed by mutual interests and day-to-day life, disintegrated after leaving the common context. The phenomenon of alienation owing to the accelerated and individualistic culture we are experiencing nowadays inspired us to study the typology of gatherings and the key features of activities that can keep communities together, regardless of generation, gender or social background.

Through analysing the patterns regarding the functionality and the elementary spatial qualities of spaces that attract and nurture communities, we came across a now largely unused element of the traditional rural dwelling: the smokehouse or so-called summer kitchen. These small units were common throughout the world from the nineteenth century onwards, as an autonomous part of the rural dwelling, built mostly separately or occasionally attached to the back of the family home, to keep all the smells, dirt and smoke generated by cooking away from the living area. It quickly became the centre of community life as it functioned as a workshop where all generations were allowed to create, work together and learn from each other.

Along with the research on the summer kitchen's evolution, we have reviewed numerous types and collected the significant attributes, dimensions and interior features together that could play a key role in its operability. By merging these aspects with the current habits and needs of society, we have designed an adaptable system that works smoothly with various spatial arrangements and structures.



According to our transcription, the summer kitchen of the 21st century consists of three main units: the floor, the 'heart' –the mass of the kitchen– and the roof, each of which is characterised and structured by the function of its location and the use of its surfaces. While the 'heart' remains consistent under all circumstances, the parameters of the floor and roof are shaped by their surroundings. The Nyári presented here is the first prototype, built on a 4,000 square metre garden, with an orchard, vegetable garden, and hen-house, surrounded by a range of wine-cellars and a stream on the hill-side of the village, Máriahalom, 40 minutes from Budapest.

WHAT IS THE NEED IT TACKLES?

Since 2018, YEF continuously faced the challenge of finding suitable spaces for youth to gather, learn, and exchange ideas. They often met under a tree or in an inadequate classroom with a carpet roof at the Pagirinya secondary school, only to be chased out for higher priority meetings. This long standing problem of inadequate spaces for youth was the driver to exploring alternative ways to build, create, and document spaces.

*IMAGE 1. Opening Nyári,
celebration of the first fire in
2021 (2021.07.24., Máriahalom,
photography by Zsuzsa Darab)*

Pagirinya Refugee Settlement houses more than 32,000 refugees¹ from South Sudan. Started in 2016, it has become a place where people from various backgrounds unite to establish a sense of community. For YEF, actualizing the Pagirinya Satellite House was more than just getting a house. It was about creating a Social Network Space (SNS) that facilitates and fosters the expression of open ideas for knowledge and experience sharing that support effective peace education, reconciliation and social mobilisation of South Sudanese youth and Ugandan host communities.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

Since most projects designed during the academic years remain on a theoretical level, as students we are rarely able to see through the complexity of a building process or delve into the massive organisation behind it. By taking our small project from concept to reality, we gained a new perspective and learned many practical tasks.

After researching the topic and exploring the site, we began the design process by defining the principles and characteristics of the three key elements: the floor, the mass of the kitchen and the roof. The floor is a 'brick carpet' that is shared equally by the kitchen island, known as the 'heart', and the dining area. The dining area is free from permanent furniture, allowing for flexibility and easy rearrangement to accommodate any situation. The 'heart' is a free-standing unit that serves as a cooking area and provides the appropriate amount of space for 4 to 8 people to work together comfortably. The kitchen island takes shape around the process of preparing a meal, which involves cleaning, processing, cooking, and serving. Each step is equally important, so all have the same amount of counter space. The island's sides have recessed holes of different sizes dedicated to storing the necessary equipment for each task. The roof is a mono-pitched design that directs rainwater towards a nearby stream.

By getting the project plan legally approved by the local authorities, we were able to begin manufacturing the complex, heavy elements in advance at a local metal workshop for the building sessions. In the spring of 2021 we held four building sessions, each lasting two to three days, during which we collectively constructed most of Nyári. In late July we held our first gathering and celebrated the 'first fire'. Since then, we have celebrated the project annually, holding gatherings and filling the site with temporary installations alongside the development of permanent facilities.



IMAGE 1 - 2 & 3. Opening Nyári, celebration of the first fire in 2021 (2021.07.24., Máriaalom, photography by Zsuzsa Darab)

IMAGE 4. Installation process of the slate roof panels (2021.04., Máriaalom, photography by Máté Lakos)





IMAGE 5. Birds'-eye view of the foundation (2021.04., Máriahalom, drone shot by Máté Lakos)

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

During the summer seasons, the community of Nyári, including builders, locals, and new friends, gather to spend time together, connect, recharge in nature, and engage in activities such as gardening, cooking, and feasting. The collaboration that led to the completion of this project demonstrates its purpose, necessity, and demand. The location has become a central point for the small village and an experimental display of contemporary rural architecture.

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

The research on the relevance of designing a summer kitchen for modern society and the process of developing the concept to a scale of 1:1 is well-documented and openly published in both physical and digital formats. It is accessible through Nyári's Instagram profile: @kert.nyari [\[QR code 1\]](#). The platform operates as a curated digital sketchbook, providing an insight into the evolution of the project, its community, the afterlife, and the additional developments in its surroundings.

IMAGE 6 - 7 & 8. Nyári's community (2021.07.24., Máriaalom, photography by Máté Lakos)

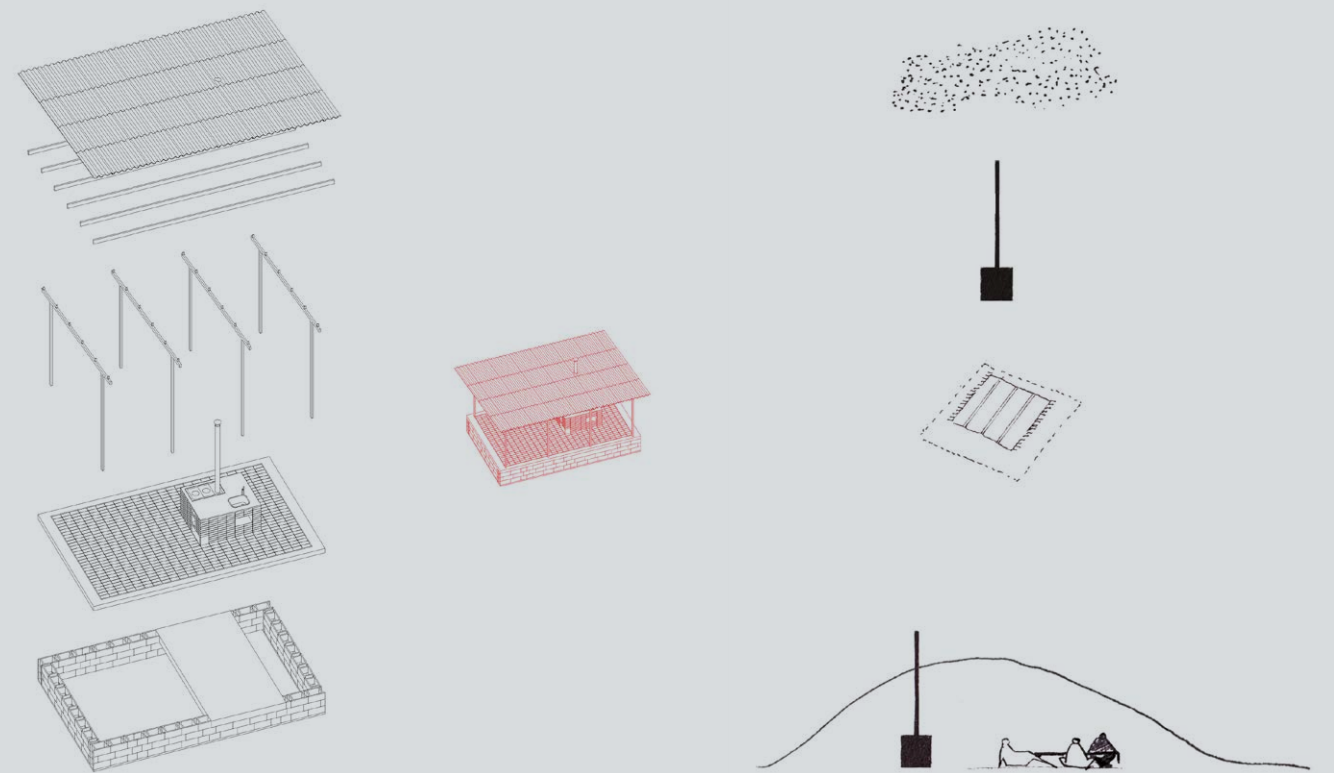


IMAGE 9. Exploded axonometric plan of Nyári's structure

IMAGE 10. Concept sketch of the three elements

QR CODE. Explore more about the research project here



WHY IS NYÁRI DISTRIBUTED DESIGN?

The prototype of Nyári was built in Máriaalom, but the concept was designed with the adaptability to respond to its context, in accordance with the local availability of materials and resources, to be built anywhere. Due to the significant use of second-hand, irregularly shaped materials, the building process required the ability to improvise on the go. In parallel, the participatory construction method also embraced unpredictability, resulting in a 'design and build' experience with collective problem-solving sessions on site to achieve clear and simple solutions.

The components of the building were sourced from local resources that could be sustainably accessed with the least amount of transport. We made conscious attempts to create as little waste as possible, and by breaking down leftover materials into small pieces we were able to mix and reuse them with other materials. For instance, the milled brick particles were dashed into the fine-grained gravel flooring and into the concrete, giving a terrazzo effect to the parts we polished.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Tamás Nagy was a Hungarian architect and multidisciplinary artist who was our professor during our academic years before he suddenly passed away in 2020. He has had a significant impact on our individuality and shaped our mindful design thinking. It would be a full-circle moment to cook and dine with him at Nyári, as his influence is clearly traceable in our mass forming and material usage.

SalvageGarden Assistive Makerspace

Community makerspace for co-creation of assistive devices for and with persons with disabilities and caregivers in Singapore

Project team

Saad Chinoy,
Jang LeongChia

Organization

SalvageGarden
Makerspace

Location

Singapore, Indonesia -
Asia

Project type

Community organisation

PROJECT DESCRIPTION

SalvageGarden [\[QR code 1\]](#) Assistive Makerspace is a volunteer initiative at the Punggol Regional Library in Singapore, with a weekly participatory design practice of empathy building through hands-on prototyping and digital fabrication.

A community initiative to address the needs of persons with disabilities through engineering and tech for good, a small but dedicated group of volunteers work weekends to invite the public in general and persons with disabilities and their caregivers in particular to the practice of Critical Making. SalvageGarden is uniquely placed in a public library building designed for accessibility that also provides a makerspace equipped with digital fabrication tools. This accessible setting allows for holding an inclusive, and constructive space where all who express an intention to address disability are invited to participate. Recognising the scope and impact limitations presented by the long established norm of outreach and engagement to address disability issues through one-off or infrequent events and workshops, this community initiative holds space regularly to allow for meaningful and sustained engagement through hands-on praxis.

This profile takes a closer look at the learning-by-doing and open source approach that's embodied within the M.I.T. (Make Inclusive Tech) Sunday sessions and the observed social dynamic considerations around disability as relates to Asian and Southeast Asian culture, and in particular the role of the caregiver in discovering, understanding, communicating, and expressing the needs of persons with disabilities.

CONTEXT AND HISTORY

Initiated by the community of volunteers contributing to assistive initiatives under the charity organisation EngineeringGood well before the now widespread adoption of 3D printing, the creative implementation of low-cost, DIY, and "life-hack" approach was applied to problem-solving for persons with disabilities working with the social associations that represented their needs.

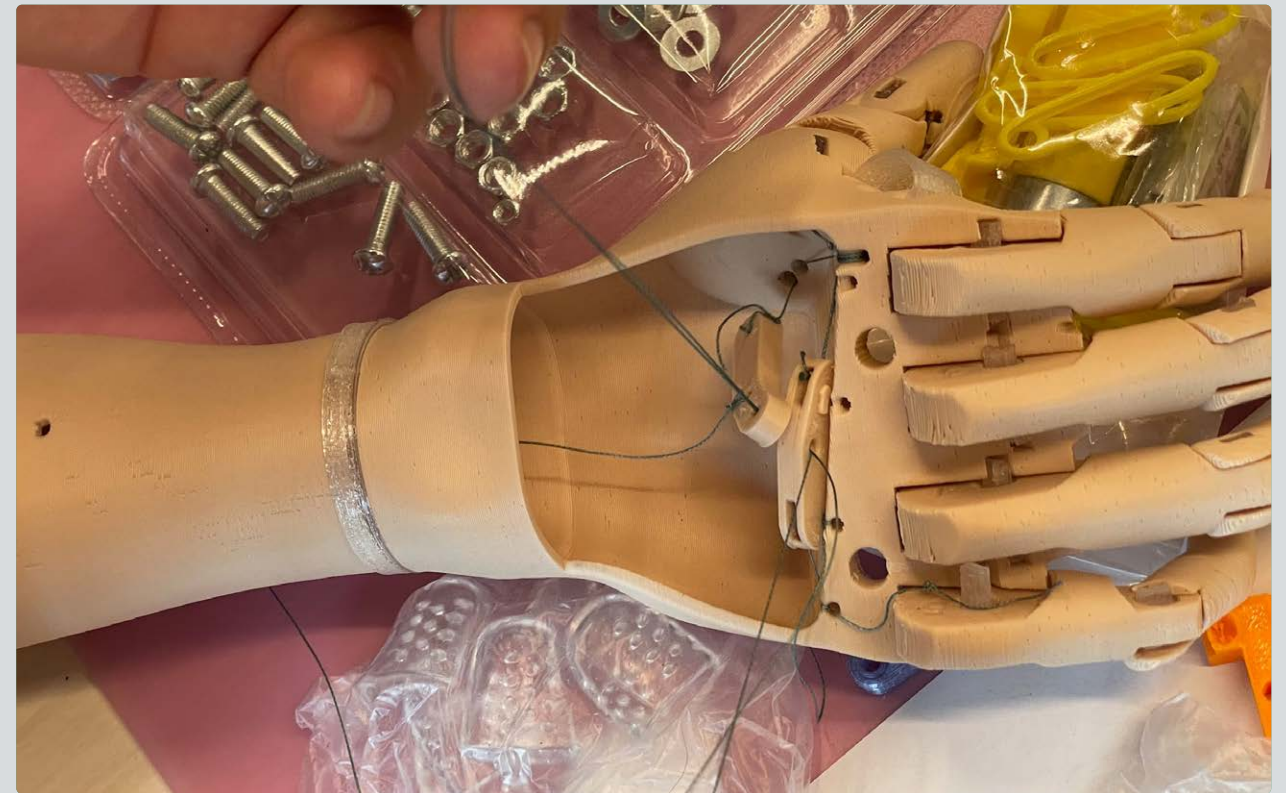


IMAGE 1. M.I.T. Sunday session participant sharing his experience from being a hobbyist angler on how to tie non-slip knots in nylon string. Prototyping a 3D printed prosthetic arm for a participant with limb differences. Opensource design: "Kwawu arm" via e-nable (Sep 24, 2023. Punggol Regional Library, Singapore. Saad Chinoy. CC-BY.)

In 2020 EngineeringGood responded to the COVID-19 pandemic by re-orienting itself to meet the social needs of the moment, with volunteers adapting their problem-solving and innovative skills to the acquisition, refurbishment and donation of second-hand laptops to low-income families. Over a period of two years, the initiative saw dramatic growth in staff, volunteer participation, and government and corporate interest while thousands of devices were received, refurbished, and successfully rehomed.

However, the assistive technology projects had to be deprioritised for the duration of the pandemic period, changing the organisation in the process. Community efforts and innovative ideas having successfully enabled the growth of EngineeringGood as an organisation and prompted by the shift in priorities, the SalvageGarden Makers initiated the assistive tech makerspace as a spin-off to re-focus volunteer effort towards serving the needs of persons with disabilities, their caregivers, and assistive tech.

In celebration of the creative and innovative spirit of the global makers response to COVID, inspired by the "nothing about us, without us", Careables, and similar global initiatives, SalvageGarden Makerspace now applies the Critical Making framework to bring persons with disabilities and their caregivers into the design and prototyping process as equal participants together with volunteer makers.

WHAT IS THE NEED IT TACKLES?

SalvageGarden responds to the need to create a recurring space and invite caregivers to participate in the design process along with the person with disabilities. From collective experiences within the Singapore context and Asian culture in general, the understanding of "Disability" and "Charity" are rather narrowly perceived and tend towards medicalisation, helpless dependence,

or both. SalvageGarden aims to challenge the established norm of corporate social responsibility and similarly sponsored campaigns that are often designed as “one-off” engagements that perpetuate narrow definitions of charity. Defining disability engagement as a problem-solution approach within the limitations of sponsorship and commercially motivated time-frames results in weak and sporadic support. With weekly participatory design sessions at a public library makerspace, SalvageGarden creates an inclusive space to invite repeated visits that result in constructive hands-on engagement. Furthermore, while the caregiver is often overlooked in the design and delivery of disability oriented programmes, our process recognises the needs expressed by the caregivers not only for the person they care for but also for themselves and their immediate environments.

Assistive technology is expensive. With the de-facto process of mass production being highly dependent on economies of scale, products designed for individuals with disabilities are priced to accommodate low production volumes or cumbersome customisation features. The overpriced factory-production and design process dominates the perceived inaccessibility of assistive technology. Most persons with disabilities and their caregivers are unaware of the lower cost alternatives that are available through local fabrication, similarly customisation and personalisation of design is often perceived as “too complex” or “too expensive”.

WHAT WAS THE DEVELOPMENT PROCESS OF THE PROJECT LIKE?

In order to create an inclusive space, a collective decision making process was adopted to respect volunteer time and effort while the Critical Making framework was essential to establishing an inclusive on-boarding process. Design thinking, and participatory design methods combined with Creative Commons and other open-source methodologies are go-to tools for developing processes. With the support of the National Library Board and the publicly accessible MakeIT makerspaces, we were able to introduce weekly sessions where an unstructured, “ask me anything” style environment is carefully maintained. All projects initiated during these sessions are openly shared within the group, and are also shared online at the discretion of the group. Tangible objects are placed on display with a short explainer to allow for ideas to flow across projects and derivative iterations to be developed. Iterative development is inherent to all projects, with space for input at all stages from participants of any background to feel like they can contribute.

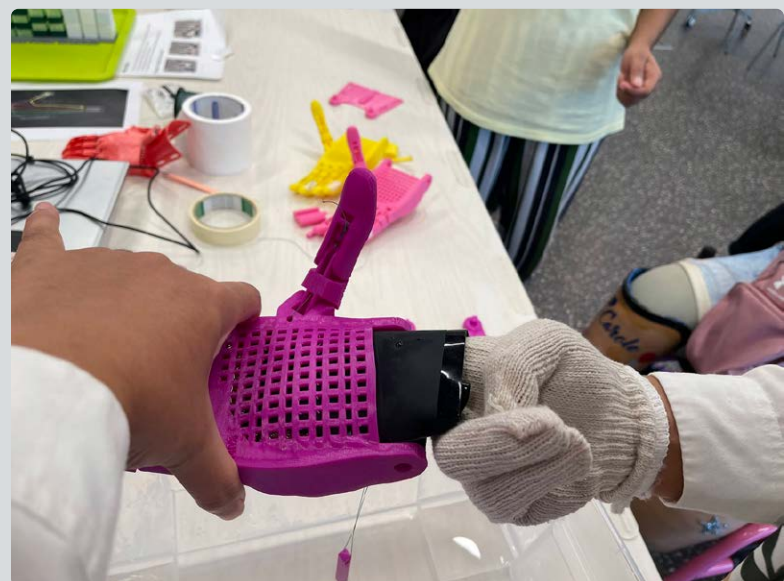


IMAGE 2. Weekly Participatory Design sessions facilitated by volunteers like L.J. Feedback review of Inclusive game design iteration session with hands-on participation, 3D printed prototypes, and learning by doing (8 Oct 2023, Punggol Regional Library, Singapore. Saad Chinoy. CC-BY)

IMAGE 3. Low cost customisation, personalisation, and local fabrication of 3D printable prostheses from the e-nable community open source designs: PhoenixHand and Kwawu Hand (10 Sep 2023, M.I.T. Sunday session at Punggol Regional Library, Singapore. Saad Chinoy. CC-BY.)

IMAGE 4. Learning by doing: volunteer maker thermofforming a modified version of the Phoenix-Hand with participation from a person with disabilities and her caregivers (10 September 2023, MakeIT at Punggol Regional Library, Singapore. Saad Chinoy. CC-BY.)

QR CODE. Continue exploring SalvageGarden here



The regularity of the M.I.T. Sunday sessions remain essential to maintain consistency of an inclusive space, projects and tangible artefacts being the conduit for engagement, and for building understanding and empathy for the environment and context of the person with disabilities and their caregivers.

WHAT IMPACT DOES YOUR PROJECT CURRENTLY HAVE?

SalvageGarden:

- Has established an inclusive, community defined safe-space for constructive, tangible public discourse about disability.
- Has introduced a challenge to the sporadic one-off engagement approach to engaging with persons with disabilities and caregivers.
- With weekly recurring public sessions, challenges the industrial and commercially dominant perspective to 3D printing, digital fabrication, and making assistive devices.

WHAT IS THE GLOBAL-LOCAL RELATIONSHIP OF THE PROJECT?

SalvageGarden as a makerspace based in a Singapore public library actively seeks to collaborate with social service agencies and other fabrication spaces locally in Singapore (medical or otherwise) while similarly maintaining relationships with global initiatives such as Careables, Makers Making Change, e-nable, and the Global Innovation Gathering. SalvageGarden Makers prefer to share and engage at events and talks through hands-on workshops and makerspace engagements where learning-by-doing is prevalent.

WHY IS SALVAGEGARDEN DISTRIBUTED DESIGN?

Bringing persons with disabilities and the caregiver into the design process affords an understanding of the tools, process, and means of production while engaging designers in social discourse that fosters empathy building. With open source design and low-cost digital fabrication at the heart of our process, each session draws from and builds upon available open source designs and processes. DIWO (Do it with others) and Co Creation encourages a non-transactional approach to making bespoke assistive devices, challenging the consumer mindset while allowing for DIY (Do it Yourself) modifications and fabrication. Facilitating and actively encouraging the contribution of designs, modifications, and experiences of the user, caregiver, and makers through open source and creative commons fosters perpetuation of distributed design.

IF YOU COULD HAVE DINNER WITH ANYONE (HUMXN, PLANT, FUNGI, OR OTHERWISE) LIVING OR DEAD, WHO WOULD YOU DINE WITH?

Slime mould. It would have to be breakfast, they seem to prefer oats and corn flakes. Fascinating creatures that exhibit an order of intelligence that we struggle to comprehend, I'd love to get to know them better!

Designing Health

Documenting social, cultural and ecological aspects of vernacular design practice inspired by traditional medicinal knowledge.

Alexandra Antih Strelcova from Haenke

A BITING ISSUE

It all began in spring 2022 when we received an invitation to participate in The Future of One Health, an interdisciplinary consortium exploring sustainable, “One-Health” solutions against vector-borne diseases. Led by the Paris-based open innovation agency SOScience and the French National Research Institute for Sustainable Development (IRD), the event brought together experts in mosquito behaviour, natural product chemistry, psychology, and traditional knowledge from Haiti, New Caledonia, Burkina Faso, and France.

And then, there was us. A small interdisciplinary research studio based between France and Czech Republic with a mission to raise awareness about the role of plant biodiversity through arts and science. Our methodology typically involves working with designers, artists and other creative practitioners, blending traditional plant knowledge with evidence-based research and innovation in order to develop projects and interventions that result in better understanding of the natural world.

Sitting in a dimly-lit meeting room at IRD's offices in Montpellier, it was soon clear our newly formed team was given a bit too ambitious of a task. The quest to find a cure against vector-borne diseases has been one of the most emblematic health concerns the global community has faced for centuries, yet few solutions have ever really worked, let alone been sustainable. Surrounded by the vigorously debating crème de la crème of francophone science, my thoughts wandered off to the very definition of 'sustainable'. What does it actually mean, given the present environmental challenges, to design for the health of large communities? Whose health is it anyway? If it's intended to benefit humans, will it concurrently respect other forms of life without impacting much of the environment? Since mosquitoes are the ones transmitting the disease, could we not cure them instead? If we discover such a solution, how can we ensure it honours traditional knowledge without falling into the trap of unethical exploitation?

Europe might be grappling with ninety-nine problems, but vector-borne diseases aren't one of them. Yet. The World Health Organisation reports that illnesses such as malaria, dengue fever, chikungunya, and Zika account for approximately 17% of infectious diseases worldwide.¹ Transmitted by Aedes and Anopheles mosquitoes, they result in over 700,000 deaths annually. Historically confined to tropical countries, they are gradually spreading to new areas, a trend exacerbated by climate change and biodiversity loss. The south of Europe is not immune to this trend either, with new epidemics expected in the coming summers.² As if wars, rising staple food prices and political regimes with autocratic tendencies were not enough: the tiger mosquitoes have arrived late to the party, but are ready to cause some solid trouble.

Seeking sustainable solutions in regions where such diseases are endemic may therefore seem quite logical. Traditional knowledge of course plays an enormously important role, not just when it comes to combating infectious diseases - medicinal properties of selected plants are regularly confirmed by scientific research. Increasingly, the One Health approach is being lauded, advocating for multicentric perspectives that extend beyond human health to the wellbeing of all inhabitants of this planet while addressing complex environmental challenges at the same time.

And indeed, local communities offer a plethora of ways to tackle the problem through traditional knowledge. In Cameroon, for instance, vernacular practices involve the use of papaya and mango leaves for malaria treatment, currently under investigation by a team of local ethnopharmacologists.³ Similarly, the neem tree, with its extensive history of medicinal uses in both its native India and “adopted” African countries, is presently undergoing testing for its efficacy against malaria-carrying mosquitoes.⁴ Both the tobacco plant and tansy have been traditionally used to repel mosquitoes. Essential oils like citronella, with their potent chemical properties, also require further investigation.⁵

Nature-based solutions have been praised for their relatively low environmental footprint, and vector



control strategies boast one rather unsung hero. In Asia, Azolla, or the mosquito ferns, have been historically cultivated in rice fields, providing a local approach to vector control and enabling farmers to naturally regulate the population of disease-carrying insects. By covering the surface of stagnant freshwater bodies, it prevents adult mosquitoes from laying eggs, impeding the growth of mosquito larvae, effectively reducing mosquito breeding populations by over 95%.⁵

IMAGE 1. In Cameroon, vernacular practices of vector control involve the use of papaya and mango leaves for malaria treatment. Pictured here: a papaya tree. © Vojtěch Veskrna

A popular phrase in the scientific articles, further research is necessary - and introducing a new product on the market may take up to decades. But even developing and scaling such products - especially those that aim, or claim to be sustainable, is a tricky issue. Very often it comes with a price, not just in terms of environmental footprint but also for the traditional communities whose expertise have in the past been systematically exploited at the expense of their own wellbeing, knowledge and natural wealth.⁶

One could almost draw a parallel between the history of plants as a resource for both medicine and materials and the world history marked by colonial expansion, extractivism, biopiracy, and unfair distribution of wealth. Taking once again the example of vector-

borne diseases, in the 17th century, the discovery of the Peruvian bark tree, or Cinchona tree, marked a significant advancement in the treatment of malaria, a disease that had ravaged much of the world for centuries. Native to the Andean forests of South America, particularly in Peru, the bark of this tree was found to contain quinine, an effective antimalarial compound. The indigenous peoples had used the bark for treating fevers, and this knowledge was subsequently appropriated by European colonists.⁷ The European demand for quinine led to intensive exploitation of the Cinchona trees. During the 19th century, the British and Dutch were particularly instrumental in establishing Cinchona plantations in their colonies, notably in India and Java, as a way to circumvent dependence on the South American supply. This was driven by the strategic importance of quinine in supporting colonial military and commercial ventures in malaria-endemic regions. The exploitation of Cinchona and its global trade not only had ecological impacts, leading to over-harvesting and near depletion of the species in its native habitat, but also reflected broader themes of colonial exploitation and appropriation of indigenous knowledge and resources. The control over quinine production became a symbol of colonial power and a critical tool in the expansion of European empires.⁷

Today, unfortunately, large-scale vector control isn't based on vernacular practices and traditional medicine, nor does it respect much of the surrounding ecosystem. In fact, vector control is mostly big business. Communities in malaria-affected regions, particularly in the Global South, often face a startling mix of preventive chemotherapy, insecticide-treated bed nets, and the direct use of dichloro-diphenyl-trichloroethane, commonly known as DDT. Initially synthesised by Othmar Zeidler in 1874, DDT's insecticidal properties were widely recognised during World War II and extensively tested by the United States in various locations, from Naples to the Pacific. Post-war, its affordability, persistence, and effectiveness led to its widespread use in American agriculture before eventually sneaking into US households as a multipurpose cleaning product.

Then, the environmental and health impacts of DDT were brought to light by Rachel Carson's seminal book, *Silent Spring*. Consequently, the United States banned DDT in the 1970s, a landmark event in environmental history. In 2001, its global use was restricted under the Stockholm Convention, except for vector control against diseases like malaria.

Indeed, the World Health Organization still endorses the indoor use of DDT in countries with high malaria rates, arguing that its benefits outweigh the risks. Yet, opposition to its widespread use is growing. Almost a century after its introduction, DDT's chemical residues persist in the environment, mosquitoes have developed resistance, and entire ecosystems have been disrupted, affecting both beneficial species and



IMAGE 2. Essential oils are studied for their insect-repellent properties. Probably the most popular is citronella. Its antifungal and anti-inflammatory properties may help to speed up the healing of wounds. © Vojtěch Veškrna

IMAGE 3. In the past, biopiracy scandals saw companies seeking exclusive rights to plants' medical application through patents. Various species including Madagascar periwinkle have all been the subject of legal disputes. © Vojtěch Veškrna

disease vectors. Emerging evidence also suggests long-term health effects, such as an increased risk of breast cancer in granddaughters of women exposed to the pesticide.⁸

With this in mind, it is increasingly important to focus on fostering interdisciplinary collaborations that may look at the problem from various perspectives. How can scientific disciplines join forces with design in order to develop new methodologies and frameworks that address current challenges related to loss of biodiversity and traditional knowledge, while at the same time respecting indigenous rights and leaving as little environmental trace as possible?

THE ROOT CAUSE

Before the advent of synthetic medicine, communities had already “designed” or developed healing practices based on medicinal plant knowledge, often shared through informal and oral traditions. Currently, around 80% of the global population relies on medicinal plants as their primary source of healthcare.⁹ Nearly two thirds of current medical treatment is based on (or inspired by) plants and active ingredients derived from them.¹⁰

Indigenous peoples guard a vast amount of knowledge about plants: up to 80% of all the world's remaining biodiversity is in the hands of traditional communities, even though they inhabit only a quarter of the Earth's surface and make up only six percent of the world's population.¹¹ For many, their primary pharmacy is the forest that surrounds them. With the dramatic decline in biodiversity comes the loss of indigenous knowledge and the potential to discover new active compounds that could lead to developing new medicines as well as materials, both often sourced from nature.

To make matters worse, corporations would in the past typically seek exclusive rights to the plant's commercial use through patents. By infiltrating traditional communities, they would obtain precious information on the medicinal value or uses, then file a case to commercialise the plant or its genome. Various plants, including Madagascar periwinkle, rooibos, and South African geranium, have been subject to biopiracy cases, with many crops such as Basmati rice, turmeric, or quinoa following suit. This has created a drastic imbalance where the majority of genetic resources originate from the Global South, while the majority of patents are held by entities in the Global North.

To address these inequalities, the Convention on Biological Diversity, introduced during the Earth Summit in Rio de Janeiro, Brazil, in 1992, has

played a vital role in recognizing and providing fair compensation to indigenous communities for their invaluable contributions. Many of these patents were eventually revoked. In 2010, the Nagoya Protocol further established guidelines for implementing an access and benefit-sharing mechanism, ensuring a clear legal framework for the fair and equitable distribution of profits derived from local resources with the traditional communities involved. Thanks to these legislative procedures, we now have a standard framework through which indigenous communities share benefits of research and its commercial outcomes.^{12, 13}

WHEN DESIGN MEETS NATURAL PRODUCT RESEARCH

As we collectively navigate increased environmental and societal challenges of today, design and its potential to drive positive systemic change emerges as particularly crucial. Various directives dealing with circular economy, ecodesign and even biodiversity have recently entered European legislation, with initiatives such as the New European Bauhaus implementing these practices on a continental level. For instance, an often cited statement - that up to 80 % of waste can be designed out - has made it to the newly established narratives of the European Green Deal and the related taxonomy, which is increasingly setting the direction for large to mid size companies in the EU and their supply chains with the introduction of mandatory corporate sustainability reporting.^[14]

But how can we “design out” extractivism and collaborate with respect, care and kinship towards one another and with other forms of life? Why is it important to understand our relationship with nature through the lens of—oftentimes excruciatingly tragic—history? What can we learn from vernacular design and indigenous practices, long deemed “too rudimentary” for the modern world to notice?

If Julia Watson's *Lo-TEK*¹⁵ or *Supervernaculars*¹⁶, the 2022 Ljubljana Biennale of Design curated by Jane Withers, highlighted the importance of traditional knowledge for architecture and design, its potential synergies with medicine have been somewhat left unattended. Yet on the intersections between medicinal plants, vernacular materials, scientific research and contemporary sustainable design practices lies an intriguing world with countless solutions for environmental justice.

In the 1980s, ethnobotany and ethnopharmacology emerged at the crossing of nature and culture. Pivotal in documenting and validating traditional practices, these disciplines helped create a unique fusion between age-old wisdom and contemporary thinking.

Researchers in this field study the medicinal properties of natural substances used by indigenous peoples and local communities, unravelling traditional healing practices and the cultural narratives intertwined with medicinal plants. This exploration could only enrich design, providing insights and inspirations for creative practitioners who seek to imbue their work with depth, sustainability, and cultural relevance.

Of course, the primary aim of ethnopharmacology is to document and validate traditional medicinal practices to unearth new potential sources for drug development or therapeutic agents. However, the impact of this research extends far beyond pharmaceuticals. When carried out in a culturally sensitive and ethical way, they can indeed foster collaborations between traditional healers, local communities, and scientific researchers, blending traditional knowledge with evidence-based approaches. Robin Wall Kimmerer, the doyenne of Indigenous science, writes of her own journey navigating between the two fields. Sweetgrass, the Native American plant she so lovingly mentions, serves as both a material and medicine. Elsewhere, she describes her experience with indigenous forest burning, producing all sorts of objects from canoes and wigwams to tools and baskets out of the birchwood - as well as traditional medicine out of a fungus forming on the trunk.¹⁷

Both disciplines can therefore offer fresh perspectives and material choices for designers across various fields, from fashion and gastronomy to architecture and product design. By understanding the properties, uses, and significance of natural substances, designers can create products and experiences that resonate with cultural heritage while embracing modern functionality and sustainability requirements. Presented below are a handful of examples.



FROM PHARAOHS TO FLAXAID

Plant-based materials have played a significant role in healing practices throughout history. Indigenous communities have long used natural fibres, often woven or braided to create flexible, breathable, and absorbent materials that can be used to cover and protect wounds. A symbol of healing in itself, wound dressings and bandages would have historically been created from plant-based fibres such as cotton, flax, nettle, and even tree barks. Linen, in particular, emerged as a prominent player in medical treatment, especially during times of armed conflicts. Ancient civilizations, from Mesopotamia to Egypt and Greece, utilised linen bandages dipped in essential oils to cleanse wounds, including those sustained by gladiators in the Roman Empire.

Modern research and innovation have breathed new life into these ancient traditions. Polish scientists, drawing on historical knowledge, have developed FlaxAid, a groundbreaking type of flax dressing enriched with antioxidants. These innovative dressings are currently undergoing testing in Polish hospitals on patients with venous ulcers, yielding highly promising initial results.¹⁸

IMAGE 4. For many Indigenous communities, their primary pharmacy is the forest that surrounds them. Chocolate, avocado, turmeric or star fruit are all endemic to tropical regions across the world. © Vojtěch Veškrna



IMAGE 5. From plant to pill. Ethnobotany and ethnopharmacology document and validate the efficacy of traditional medicinal practices. Their interdisciplinary ethos extends beyond botany and encompasses fields such as gastronomy, fashion and design. © Vojtěch Veškrna

MENSTRUAL HYGIENE

Indigenous communities have used various plant-based materials for sanitary purposes. Apart from banana leaves, fibres from plants like sisal, agave, or reeds have been woven to create menstrual pads or absorbent liners. In rural India, access to sanitary products is limited and expensive, resulting in approximately 23 million girls dropping out of school each year. With only one-third of menstruating people having access to sanitary pads, many rely on plastic alternatives. This results in an alarming amount of waste, equivalent annually to ten times the weight of the Great Pacific Garbage Patch.

To address this issue, startups like Saathi have emerged, producing biodegradable sanitary pads from discarded banana plant fibres. By repurposing a readily available resource that decomposes within 6 to 18 months, a single banana plant stem can yield 3000 pads. Similar initiatives are also underway in Kenya and Uganda.

LET THY FOOD (PLATE) BE THY MEDICINE

When it comes to integrating indigenous and traditional practices with sustainable solutions, India stands at the forefront of such initiatives. Nestled in Raipur, central India, you'll find Bhagyashree Herbal Farms, run by the Chaure family. Embracing age-old methods of organic, sustainable farming, they not only produce herbal remedies and biodegradable food packaging but also provide employment and share profits with women from the Bhunjia indigenous community.

Besides cultivating a host of medicinal plants from ashwagandha to tulsi, the cooperative is known for producing pattals, traditional food plates crafted from leaves of various plants. In India, the practice of serving food on leaf plates is steeped in cultural, religious, medicinal, and socioeconomic significance. But imagine if eating from pattals was not just biodegradable but also scientifically proven to offer health benefits as a bonus.

The use of leaf plates and bowls for dining traces its origins to ancient Hindu, Jain, and Buddhist texts. Ayurveda, the traditional Indian system of medicine, often recommends and even prescribes eating from plates made of leaves from various species, including banana, lotus, ficus, water lilies, curcuma, or the sal tree, each of them having different health benefits. Concurrently, independent research has confirmed that leaves of some of these plants do indeed contain active substances with potential medicinal properties.^{19, 20, 21} Thus, the concept of biodegradable

and health-enhancing food becomes a tangible reality, presenting an intriguing alternative to single-use, fossil fuel-derived materials laden with harmful chemicals.

PLANT-BASED DYES

The prevailing issue with modern textile production lies in its dependence on synthetic dyes. While these chemicals offer durability and vibrant colours, their environmental toll and potential health hazards are everything but millennial pink. In this context, plant-based dyes emerge not only as a nod to traditional practices but as a solution aligned with contemporary environmental and health imperatives. The use of plant-based dyes in traditional textiles has been well-documented, encompassing a range of vibrant colours from cochineal red to indigo blue. Turmeric and neem are equally known to possess antibacterial and antimicrobial qualities, offering added health benefits and protection to garments. So what if, based on traditional practices and indigenous knowledge, we could go beyond aesthetics and incorporate plant-based dyes for their health-related properties?

A recent systematic review encompassing 38 studies has spotlighted six plants - eucalyptus, weld, madder, annatto, true indigo, and woad - that on top of being rather stable dyeing agents also offer an array of medicinal benefits.²² For example, eucalyptus dye, with its soothing scent, also boasts antibacterial properties, making it a candidate for health-conscious textile applications. Similarly, other natural dyes offer protection against UV rays, with some exhibiting anti-inflammatory, antioxidant, and even anticancer properties. Beyond imparting a vivid yellow hue, weld-dyed fabrics have demonstrated significant antibacterial activity, retaining these properties even after numerous washes. This enduring effect, especially against gram-positive bacteria, underscores the functional value of these dyes.

Indigo plants have long been utilised for producing blue dyes, a practice dating back to prehistoric times. Notable for their absence of mordants, these dyes boast a range of beneficial properties including anti-UV, anticancer, cytotoxic, or antiseptic qualities. Furthermore, they hold potential in the treatment of various conditions, encompassing dermatological, respiratory, and infectious diseases.^[22] Valuing and learning from these traditional practices could therefore prove essential to move forward in resolving the major challenges the textile industry faces.

IMAGE 6. Throughout history, certain materials have played a significant role in healing practices. Modern research and innovation has breathed new life into these ancient traditions. © Vojtěch Veškna



BACK TO THE FUTURE, LITERALLY

In our age-long quest to design human health, the 20th century witnessed incredible advances in medical research that propelled certain diseases into oblivion. Sadly, this progress also led us to overlook a crucial fact: we are an integral part of the surrounding ecosystem, not separate entities. With a zealous application of standardised foods, GMO crops, intensive agriculture or single use plastic, we have effectively isolated ourselves in sterile environments – both literally and as a metaphor. As Beatriz Colomina and Mark Wigley write, we have become allergic to ourselves, to our own hyperextended body in a kind of autoimmune disorder.²³

If design is considered a vehicle for social change, then materials act as its indispensable fuel. The search for regenerative materials has indeed borne fruit, yielding promising results from sources such as seaweed, mycelium, agricultural waste, food industry by-products, and so-called invasive species. A deeper understanding of plant biodiversity can play a crucial role in tackling the pressing environmental challenges our society faces. By gaining a more profound appreciation of the role of our natural heritage, designers can make informed decisions that reduce environmental impact while creating projects that are truly sustainable and impactful.

Although the well-worn mantra of 'reduce, reuse, recycle' remains crucial, the urgency of our situation means that novel approaches are swiftly gaining traction. Creative practitioners worldwide are exploring everything from biomaterials and the revival of long-forgotten local crafts and cultural traditions to nature-based solutions.

In response to her own research that revealed high toxicity levels in textiles, Dutch designer Nienke Hoogvliet created H.E.R.B.S., a quilt made from pesticide-free European linen. Using rosemary, sage, and chamomile as natural dyes, her project explored the potential release of beneficial substances for the well-being of both skin and health.

Seaweed has long been utilised both as a material and a medicine for centuries. Crafting Plastics!, a material research studio led by Slovak designers Vlasta Kubušová and Miro Král, has elevated this humble sea plant to new heights. Last year (together with Dumolab) they unveiled Sensbiom 2, an interactive installation crafted from biopolymers derived from seaweed and cellulose. These objects react to solar radiation by changing colour. Currently they are working on a new version, where they infuse environmentally-responsive biomaterials with olfactory receptors to find future applications in the packaging industry, detecting food freshness. Such innovation has the potential to significantly reduce waste, streamline logistics, and mitigate numerous health issues.

Fernando Laposse is a Mexican designer known for his work that intersects with environmental and social activism. Particularly recognized for his use of natural materials and traditional techniques, often from his native Mexico, to create award-winning design pieces. From avocado skins to corn husks, his work frequently involves collaborations with indigenous communities, aiming to bring attention to social and environmental issues while also providing economic benefits to them.

Located in Arles, at the gateway to the breathtaking Camargue region in the south of France, Atelier LUMA is a circular design lab dedicated to pioneering new materials. The organisation embraces bioregional design practices, an approach developed under the guidance of curator and design theorist Jan Boelen. Recently, Atelier LUMA has introduced a range of products that celebrate local cultural heritage while also boasting health benefits alongside aesthetics. These include door knobs made from sea salt, known for its antibacterial properties, and, coincidentally, mosquito nets fashioned from a paper thread. Rather than simply scaling up production and exporting goods overseas, the organisation applies its methodology in diverse geographical contexts and ecosystems.²⁴

CONCLUSION

Our journey through the realms of design, sustainability, and healthcare has underscored a profound truth: the future of health is inextricably linked to our relationship with the environment. The resurgence of interest in indigenous knowledge and practices, coupled with the integration of contemporary scientific research, heralds a new era in design – one that respects and learns from the wisdom of the past while innovating for the future. As we navigate through a world grappling with environmental degradation and health crises, the synergy between traditional wisdom and modern innovation offers a beacon of hope. It's a pathway to developing solutions that are not only effective but also respectful of our planet and its diverse cultures. By doing so, we open the door to a world where design not only solves problems but also heals, nurtures, and sustains – for the benefit of humanity and the planet alike.



IMAGE 7. Indigenous groups across India have incorporated plant-based dyes such as turmeric for their antibacterial and antimicrobial properties, offering added health benefits and protection to garments. © Vojtěch Veškna

Fostering Symbiosis in the Eusocial Realm

The state of the mycelial hive design in HIVEOPOLIS

By Asya Ilgün and Thomas Schmickl from Artificial Life Lab of the Institute of Biology, University of Graz, Austria, and Kostadin Angelov from Pollenity, Sophia, Bulgaria

The Western Honeybee (*Apis mellifera* L.) reveals a fascinating world at the intersection of ecology and design. They have a crucial function as pollinators, an interesting history of their domestication, and they seem to reside at the right balance between human requirements and the well-being of these vital insects. Honeybees, well-known for their important role in agriculture, have a long history that is entwined with human civilisation. They were discovered as a sugar source thousands of years ago and their products rapidly became an important part of human diets and economics. Their unique behaviours and eusocial self-organisation not only fascinate scientists, but they also teach us valuable lessons on adaptability and community dynamics.

The life history of honeybees, which were formerly set in wild forests, has been gradually changed by human involvement. Formerly, Western Honeybee nests were naturally sheltering inside old tree cavities. Our modern beehives, the products of a longstanding and extensive design effort, are mainly focused on human convenience, including modularity for easier honeybee healthcare and orthogonality for easier fabrication. This shift is a significant human intervention in nature. As with many such interventions, it has brought irreversible changes.

This shift in habitat raises considerations about animal welfare ethics, human-honeybee coevolution, and the role of design practice in this process, i.e. either aiding in promoting a healthy and mutualistic co-existence with these insects or exploiting them as farming equipment. As we manage many environmental issues that arise from intensive agricultural practices and their influence on bee numbers in general, we must reconsider our approach to beekeeping and habitat building. This study investigates the biological and technological design principles and processes that support humans' interactions with honeybees at a liminal level.¹ Liminal intimacy, or intimacy at a distance, thrives on maintaining space, understanding that too much closeness can often overshadow or trivialise the uniqueness of the other.² Therefore, this investigation is about more than just supporting

honeybee survival and health; it is about redefining our relationship with the living environment, our socio-cultural context and recognising the interconnectivity of all living species. Following this, this article is aimed at encouraging readers to think about the possibility of intervening with ecosystems to not only meet human agricultural, economical, aesthetic requirements but also to enrich the natural life cycles of these important pollinators.

ADAPTIVE CANON EFFECT IN BIOHYBRID DESIGN CULTURE

Biohybrid architecture is an emerging scientific field that combines nonhuman biological systems (plants, microbial communities) with technical components to meet architectural objectives set by designers or "initiators".³ Architectural objectives typically involve sheltering in strategically confined experiences. Providing architectural experiences, particularly haptic sensations, requires stable structures for sufficient periods of time and of appropriate size for human inhabitation, which is the final barrier for biodesign practice in the construction industry. Unlike typical architectural projects, a larger portion of the design performance is received after the fabrication of the required parts is accomplished. Thus, objectives are frequently determined by predicting, simulating, or speculating on the in-situ performance of the artefact. This approach raises challenges, specifically about the needs and responsibilities of living components and the designers' roles in such architectures.

Another fundamental challenge arises when these living components – whether residing in or visiting the architectural construct – are given a role in selecting and adjusting their aims, ultimately influencing the realisation of the designer defined objectives. This scenario involves the designer going beyond the initial concept and design phase to create a care regime that others may learn and implement. This care regime is based on understanding the species'

"biological life cycles" and recognising that they occur on different time frames but can overlap, impact, and be affected by complex environmental events.

The shorter life cycles of organic materials used in biohybrids are a prominent design subject. Healthy ecosystems need water, sunshine, and soil nutrients. Thus, biological life cycles depend on their cycles, such as the water cycle (evaporation, condensation, and precipitation) and the nutrition cycle (plant intake and breakdown). This suggests that biohybrids should make technical and inherent rebuilding of organic components possible. The degradable materials employed at Ise Shrine in Japan and its cultural and spiritual value require reconstruction every 20 years, perhaps for the last 1300 years.⁴ For thousands of years, West African climates have varied, prohibiting society from building large cities. The whole community utilised and repaired banco, a non-durable construction material that hardened with solar energy. This made groups more mobile and sociable, relying less on a fixed cityscape and more on fluctuating ecological limits.⁵ Rebuilding structures may appear ineffective, and it may not be sustainable in all cases. However, socially, culturally, and environmentally driven rebuilding skills and habits can support human life in harmony with their natural and cultural environments, reducing climate change vulnerability. In the face of climate change, software models and digital fabrication make reconstructive care for structures increasingly more important.

Ecologically responsible (re)construction is crucial for biodiversity. Biohybrid architectural systems include micro-ecosystems, which are smaller and more carefully defined networks of organisms that exchange energy and nutrients. It is important to note that below a particular size and complexity, the ecological systems are known as biocenosis.⁶ Due to their smaller size and defined bounds, micro-ecosystems have more regulated and visible component interactions. Multiple living components in a building may sustain each other metabolically, forming simple ecosystems. Beyond inert construction materials, this strategy demands "biological life cycle thinking" and considering multispecies communities in design and operation.

These architectural ecosystem boundaries (the physical design of the biohybrids) and their keystone species dictate the architecture's operational phase, or most active life span, depending on the designer's goal. A multispecies view of architectural products implies that biohybrids are neither alive nor dead once the notion materialises. Visibility levels and operations may change over time while this system is incorporated in a macro-ecosystem that supports the biohybrid architecture. A biohybrid architecture must sustain itself well enough for all biological and ecological interactions to occur safely (operational performance) to be "ecosystem effective" in the micro (inside) and macro (surrounding).

In engineered systems that include natural processes, biological life cycles and abiotic processes overlap and intertwine in a dynamic manner that can only be designed and anticipated to some extent. How do we conceptualise such a complex design question? Even at a micro level, all ecosystems are impacted by many elements and have a degree of complexity that analogies and models cannot fully capture. Yet, we find that contemporary canons like phase music are fascinating imagineering tools. Like musical composition, biohybrid design activities have constraints and compositional elements. One or more melodies—organisms or abiotic factors—follow their own nonlinear trajectory at different speeds while interacting and overlapping. This is the designer's job: selecting well-fitting living entities with life histories that can overlap and support one other. Just as exact patterns produce harmony in good music, not all songs incorporating them sound well. This adds layers of creative intuition, skilled workmanship, investigation, and empirical testing to a type of architectural production that originally is founded on scientific and engineering research.

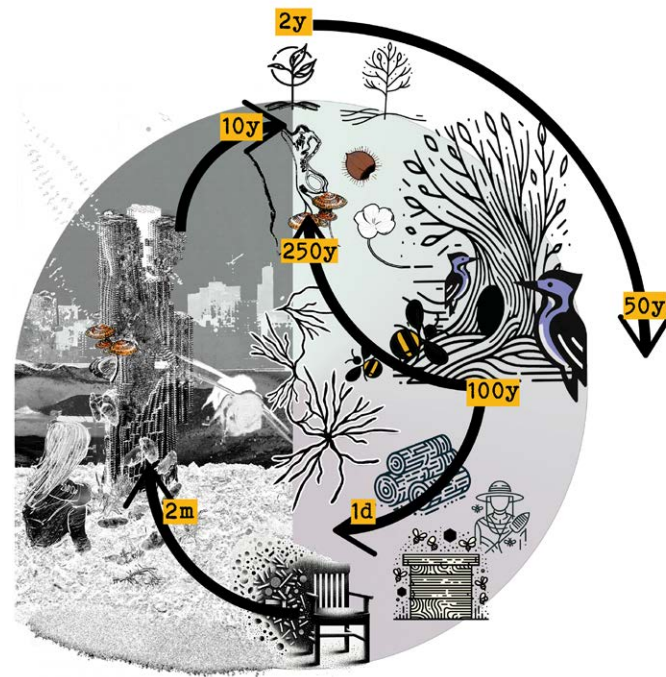
FOSTERING INTERACTIONS

Humans' access to fossil fuels greatly increased industrial output and has resulted in fast land expansion and the unsustainable use of resources. This led to an unparalleled decline in biodiversity which severely harmed symbiotic interactions amongst species. While quantifying the magnitude of this harm is a tough task, one long-term solution can be to identify and strengthen mutually beneficial interactions in ecosystems.

Symbiosis means "living together". It requires the two (or more) different species to live together, either parasitically or mutualistically supportive. Mutually beneficial relationships provide higher resilience for the involved organisms to be more resilient against environmental stressors.⁷ To operate well in an ecosystem, a design should provide a material stage for such relationships to occur, progressively joining the network of species depending on one another and the overall network. This approach is particularly effective when at least one of the species involved in these reconstructions is robust, connected, adaptable, and shows a high degree of resilience and material cognition – such as honeybees.

Biodiverse ecosystems support and sustain its various forms of life, maintain ecological balance, and are generally resilient to changes or disruptions. Many of the major events in the diversification of life can be traced back to the appearance of novel species interactions.⁸ Amongst countless types of indirect or direct interactions between different species, mutualistic symbioses shape the evolution of species and ecosystems and catalyse the emergence

of biological complexity, yet how such symbioses first form is often unclear.⁹ Other than the obvious ones such as plants and pollinators, evidence has been found for example how microbiomes that occur in animal nests because of the many species overlapping, affect these nesting animals in various ways.¹⁰ On the other hand, mutualistic symbiosis creates dependency, this can easily become an evolutionary one-way street. Termites and their mutualistic symbiont wood-decay fungi are codependent. The fungus cannot exist outside of termite mounds and the termites cannot live without it, as they cannot digest the wood. So, there will be huge selective forces to develop adaptive self-regulatory mechanisms. There is interesting research on how plant dwelling insects could be relying on medicinal secondary metabolites of these plants for self-medication,¹¹ potentially with the role of fungal volatile compounds.¹² Similar idea was in Stamets' observation and finding on mycelium and honeybees.¹³



BIOLOGICAL LIFE HISTORIES

Compared to a musical canon, hybrid living systems peak in complexity when life cycles like animal mating seasons, plant blooming, and soil microbial activity overlap. Underlying rhythms hidden behind this complexity, in the ecological comparison of the energy flow and nutrient cycles, ensures continuity – sustainability. To imagine, consider the choreography at minute 4.30 in the 1964 film *Canon*.¹⁴ This article invites reflection on creating living compositions with biological change and harmony, held together by at least one component at every stage of its life cycle. Let's take a multispecies interaction scenario with a key habitat such as a European Beech tree that shows complex interdependence. Long-lived trees, woodpeckers, fungi, and beekeepers interact within this system.

European Beech trees, which may survive up to 500 years, play an important role in wild ecosystems. The beech nut seeds are ingested by deer, birds, and small animals, but some seeds germinate if left uneaten, despite the hurdles provided by hard winters. After reaching approx. 50 years of age and establishing a trunk 30 cm in diameter, these trees begin to flower and give fruit every 5-7 years.

Two animal species in these ecosystems, woodpeckers and honeybees, rely substantially on old trees. Woodpeckers, with an average lifetime of 10-11 years, build their nests in hardwood trees. There they eat beetle larvae, mark territory and mate. Their life cycles are inextricably linked to the availability of trees populated with insects and microorganisms. Woodpeckers contribute to the ecosystem by drilling holes in trees that not only serve as nests for them but also expose the wood to be colonised by fungal

spores. This fungal colonisation, which is more active during warmer, wetter seasons, aids also on the ground in the breakdown of organic debris such as fallen branches and leaves, enriching the soil, and boosting forest health.

In the wild, honeybees rely on such trees for nesting as well. They need cavities of around 40 litres, which can only be found in older trees, to establish their colonies. Worker honeybees have a short life cycle, going from egg to adult in about 21 days and live for only six weeks. They perform an important part in flower pollination. The queen bee lives for 2-3 years and lays up to 2000 eggs every day during the active season.

When forests are conserved rather than converted to monocultures or exploited for resources, habitat formation occurs over extended periods of time. When a century-old tree is cut down – which is usually when trees are 100 years old – a crucial habitat potential that has developed over 150-200 years is lost. This reflects a larger environmental issue: widespread logging and monocultures in our ecosystems not only reduce biodiversity but also disrupt ecological connections and alter the nutrient cycle. Consider a fallen beech tree made wooden Langstroth Beehive. This beech, formerly a 100-year-old lumber-producing giant, might be transformed into a new sort of honeybee housing, a wooden beehive. However, this repurposed habitat is being employed in monoculture agriculture ways, deviating from its natural ecological

IMAGE 1. A biohybrid architectural beehive scenario depicted in the life cycle of a logged and undisturbed beech tree. The time durations (year, month, and day) are estimates based on the web literature (image credit: Asya Ilgün).

and biological multispecies responsibilities in the forest. While beekeepers methodically maintain these hives, ensuring bee health and productivity and even collecting honey, they must also navigate the challenges posed by modern agricultural practices such as pesticide use.

Each species in this multi-species interaction system has evolved to function both independently and as part of a wider linked web. These animals' life spans and reproductive strategies differ greatly. While plants, such as beech trees, generate millions of seeds each year, bees face enormous hazards while attempting to renew their colonies by swarming. Woodpeckers and humans reside somewhere between these two extremes.

Each component's life cycle and behaviours in this multi-species interaction system are interconnected. Species' life spans vary widely, as do their reproductive strategies: Every year, plants produce millions of seeds, and bees take great risks to replenish their colonies by swarming. Woodpeckers and humans reside between these two extremes. Each component has evolved to function independently while staying deeply connected to the others. The timing of one (for example, a beech tree flowering) stimulates activities in another (for example, a bee seeking for nectar), resulting in a continuous, dynamic interplay of life cycles. The saprophytic fungus spreads millions of spores via the air and settles on the pecked trees' moist wooden surfaces. Wood degradation and environmental impacts might take years or decades. Many factors can lead honeybees to nest in these cavities.

We add a fractal layer that combines the fungus' abilities as a material builder employing waste materials like carpenters' waste from constructing furniture or beehives. The designer/maker's role here is to enter this cycle by developing methods of utilising what is available and reconstructing lost habitats that can serve architecturally and ecologically. The mechanical strength of the mycelium beehive architecture is derived from a 3D printed scaffold, augmented further mechanically and thermally with the infill volume from wood waste bound with mycelium, linking it back to the circular material networks. This structure is of course not to replace trees, but it takes less time to grow (construct), providing natural homes for these species and supporting the formation of a micro-ecosystem that interacts with the larger macro-ecosystem. Here, honeybees play an important role in acquiring plant nutrients and producing heat, allowing macro-ecosystem components to enter the hive. Mycelium attracts other species and can nourish numerous insects, perhaps returning the hive to a more biodiverse condition. Because of the literature on their biology for reference material, honeybees are suitable for building and testing such a hybrid design. However, because many species lack natural nesting possibilities, the processes can also be used by other species.

COMMON BEEHIVE DESIGNS

We can gain insights into how design of the beehives and human interaction with this species are directly affecting each other by looking into the past and present of honeybee habitats. The ones that have been largely adopted by humans, thus having been populated and distributed largely, have a large impact on the ecosystems they are in. The evolution of the human-made beehives which are either human and honeybee preferred guides us to rethink these design artefacts in directions better aligning with our time's ecological and ethical imperatives.

The progression of hive design, particularly focusing on modularity and mechanical operability, has been central in advancing our understanding of honeybee colonies and the geometrical aspects of honeybee combs. The Langstroth Hive's introduction in the 19th century, with its modular structure and the concept of "bee space", allowed for unprecedented accessibility and management of bee colonies. The ability to easily remove and inspect individual frames without disturbing the entire hive facilitated closer observation and study of the geometric patterns in honeybee combs. This hive's design enabled customization according to colony needs, leading to variations like the Top-Bar Hive, Warre Hive, and others, each maintaining the principle of operability but catering to different beekeeping practices. These designs have not only improved beekeepers' ability to manage and harvest honey but also provided insights into comb-building behaviour, revealing efficiency in space usage and structural integrity.

The natural or wild beekeeping approach allows bees to construct combs in completely natural surroundings, like hollow logs or tree cavities, without standardised frames. This method offers perspective on bees' innate architectural abilities in less controlled settings. It is chosen for conservation, education, or a desire to encourage a natural living environment for bees.

These hives show how varying degrees of human intervention in hive design can influence both practical beekeeping and scientific observations, enriching our knowledge and appreciation of these essential pollinators. In the context of beehive design, the goal of our project HIVEOPOLIS¹⁵ is to achieve a harmonious blend of technical, biological, ecological and aesthetic elements that meet the ecosystem's demands, particularly those essential for the honeybees

HYBRID BEEHIVES

In HIVEOPOLIS, several research questions focus on honeybee behaviour, especially in outdoor beehives using sensing and actuating elements. These research

activities have evolved into a fusion of technology and design. Like the already existing modern hives described above, HIVEOPOLIS hive designs allow different levels of physical interaction with the bees, therefore different levels and frequencies of visual monitoring of the inner nest dynamics. There are two hive topologies developed in HIVEOPOLIS, one that brings technology in the centre and one that brings honeybee colonies in the centre - literally in the spatial design of the hive not metaphorically in discourse. The main strategies for monitoring and interacting with honeybees are centred around hardware and software technology. Yet, in an intriguing twist, mycelium composites are introduced as vital players in a novel ecological narrative. This approach goes beyond creating a beehive for the bees for ecological sustainability in the pure material life cycle thinking. Envisioned to serve as an ecological integrator, it delves into the challenges of synergizing two distinct species from separate organismic kingdoms, using digital technologies for modelling and fabrication during the pre-ecosystem embodied phases, and monitoring during empirical assessment. It's about reshaping our approach towards addressing ecological challenges by seeing our design through the lens of cross-species collaboration.



REMOTE MONITORING AND BIOCOMPATIBILITY

The concept of ecosystem effective design is a multifaceted challenge. It involves not only understanding the ecological dynamics but also considering practical applications and limitations.

Monitoring beehive health is crucial from an animal-centric perspective. Observing the brood area, tracking pollen foragers, and monitoring thermal conditions provides insights into the health and wellbeing of the colony. How do we, as a society deeply intertwined with these ecosystems, ensure our designs not only support but also enhance the lives of these essential creatures? As humans significantly influence ecosystem-related cycles, the acceptance and integration of these designs into human society are paramount for their effectiveness.

Remote monitoring offers numerous advantages over traditional methods for observing and managing beehive colonies. Integrating sensors in traditional beehives designs is challenging because of the tight space constraints and the specifics of internal hive environment and colony activity. Some types of sensing, like taking high quality images of combs and cells, are extremely difficult because of the small spaces between frames in a traditional beehive. Redesigning the internal space of the hive with the aim of seamlessly integrating technological components



IMAGE 2 & 3. HIVEOPOLIS has two main beehive topologies. Left: Star Topology Hive with technology in the centre. Right: Mycelial Hive with Honeybees in the Centre. (Photo credit: Asya Ilgün, spring/summer 2023).

IMAGE 4. The vertical wooden frame with a wireless temperature - relative humidity sensor system (developed and manufactured by Pollenity) (Photo credit: Asya Ilgün, summer 2023)



opens new possibilities of observing colony dynamics. In combination with novel materials and manufacturing methods remote monitoring systems can be integrated into the honeybee environment in a seamless and biocompatible way so that they do not interfere but on the contrary - support honeybee colonies in their natural lifecycle. While such novel hive designs may sacrifice some operational efficiency compared to traditional designs, the ability to integrate more tightly into colony processes opens numerous possibilities for advanced interaction with honeybees and the wider environment they inhabit.

Visually inspecting the frames of a beehive with high-resolution cameras allows to identify brood and nectar cells, monitor queen activity, and detect serious threats to colony health and development like varroa mite infestations, American Foulbrood and other common parasites and diseases that contribute to colony loss by periodically taking a photograph of each individual cell. Integrating high-resolution cameras in beehives is a huge challenge because all the factors listed above make taking consistent high-quality images over long periods of time problematic. In HIVEOPOLIS several options of modifying the topology of the beehive were explored in search of an approach to visually monitoring individual frames and cells.

In addition to the brood, visually inspecting resources that honeybees bring into the hive such as pollen and nectar can provide a way to determine what kind of plants foragers are visiting, allowing us to study a large area of the ecosystem that the colony inhabits in effect turning the bees into biosensors for remote monitoring the environment. In this way remote monitoring beehive colonies can become an invaluable tool in better understanding anthropogenic effects on the environment, evaluating our efforts to integrate more sustainable practices into our society and exploring novel ways of advancing society in a harmonious way with ecosystems. In this sense data collected from remotely monitored beehives can be engaging to a far broader audience than just beekeepers, supporting efforts to preserve, restore and evaluate natural habitats and to achieve more sustainable agricultural practices.

MYCELIUM AS AN ECOLOGICAL INTEGRATOR AND MATERIAL MAKER

Mycelium composites, when prepared sustainably without extractive processes and composed with substances degradable in nature, offer an organic alternative to conventional thermal insulation materials. When tailored in a controlled environment for specific mechanical and biological properties and incorporated into the honeybee's nest as part

of its enclosure, these composites can modify the microclimate within the hive – enhancing humidity, stabilising gas levels, and preventing harmful microorganisms – thus boosting the overall health and well-being of the honeybees.

To explore viability of mycelial composites as part of honeybee nests, several scientific questions have been formulated since the beginning of the project HIVEOPOLIS: whether fungus material is safe for direct contact with honeybees and if it can serve as a food source, if mycelium can proliferate within a 3D printed substrate and how different material compositions affect growth, concerns on the potential medicinal benefits of the material for honeybees, particularly its antibacterial properties against diseases like American Foulbrood with comprehensive microbiome studies planned. The state of the answers to these questions can be found in the paper by Ilgün & Schmickl (2022).¹⁶

STAY-IN /TRANSIENT SCAFFOLD

The design process of the scaffold for the mycelium composite is a top-down negotiation of habitat geometry with the purpose of enabling honeybees and mycelia to do their own thing¹⁷ and, if successful, create mutually beneficial interactions. This would provide a balancing factor and decrease honeybees' reliance on humans by reintroducing them into interconnected complex ecosystems. During the initial design phase, we focused on geometric constraints given by the habitat specifics of healthy honeybee colonies and thermally insulating layers of mycelial composites. The outcome was an elongated, organic form, calculated through parametric modelling to encase a volume of 40 litres while minimising surface area.

Throughout the project, we have consistently employed the same modelling approach and topology. We have made a few modifications to the geometrical parameters since the first hive scaffold was made in 2019. These include changing the shape and area of the entrance hole, increasing the density of 3D printed walls, and adjusting the volume of the chamber for honeybee nesting. We presented the approaches used in the manufacture of thermoplastic-based scaffolds for mycelial composites, as well as clay-based scaffolds, in our 2022 article Mycelial Beehives of HIVEOPOLIS: Designing and Building Therapeutic Inner Nest Environments for Honeybees.¹⁸

In summary, the design process started by setting up an intuitive parametric model, which was continually adjusted to meet various criteria in addition to the geometrical ones. This process can be described as a top-down approach in decision-making, focusing on setting up a model that can be fine-tuned to address multiple performance objectives including biocompatibility, structural integrity, cost

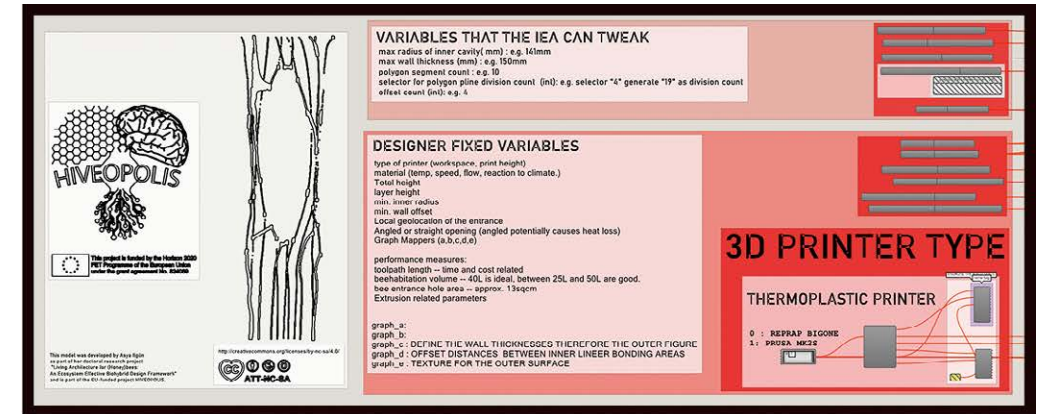
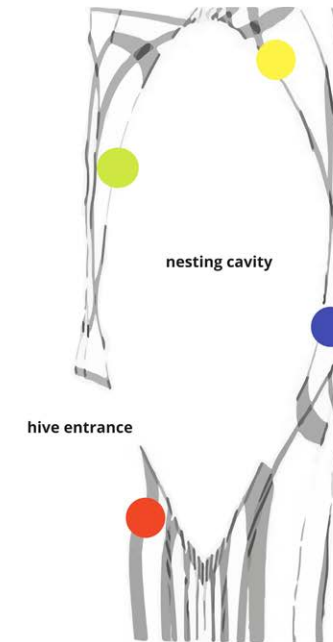


IMAGE 5. The scaffold's physical and digital realms. Top: A snapshot taken from the Grasshopper3D and Rhinoceros3D design script. Included at the instructables link as open source. Centre: Varied hive profiles. Bottom: A close-up shot of the wood-PLA composite that was freshly printed (image credit: Asya Ilgün)



of the material and fabrication to volumetric, thermal requirements, and aesthetic appeal. The initial geometric model was then refined to align with two key constraints: the chosen fabrication method, fused deposition manufacturing, and the necessity for the model outputs to be compatible with the language of digital fabrication machinery, specifically G-code (geometrical code). This design process yielded types of structures resembling columns resembling tree trunks, encompassing most of the necessary components for a healthy honeybee habitat (we discuss how to further improve in the conclusive sections of this article). The design was monolithic in its concept yet modular in its assembly, reflecting a balance between aesthetic appeal and practical functionality. The thick roof walls are an integral aspect of this design because they make use of the fact that the logarithm of the ratio of the inner and outer radii determines the conductivity. The tapering uneven top of actual tree cavities will also exhibit this effect, which opens the door to even lower conductance in that area (a topic for future research).¹⁹

HOW TO ADAPT, MAKE AND ASSEMBLE YOURSELF?

Created with the purpose of making an online and accessible appendix for this article, this Instructables post [QR code 1] will bring you through the process of creating entirely 3D-printed and mycelium-grown beehives—or what we prefer to call bees nest enclosures—using a biohybrid design approach. A streamlined and accessible instructable for anyone interested in engaging with the many concepts and digital technologies are in this post. Our goal is to

provide this content to encourage the readers to try adapting their ideas and potentially employ regenerative making practices in their own regions, bringing this beehive concept to best practice communities where more ecosystem impact can be studied. We also note that we are simultaneously working on using the same biofabrication methods (transient or stay in scaffolds to contain mycelium composites) to make habitats for wild pollinators, to think of animal architectures to create multi(bee) species where honeybees are the Eusocial members of a large collective of pollinators. [QR code 1]

DESIGN ITERATIONS

Our attempts with clay scaffolds were hampered by clay's strong water reactivity, shrinkage, and weight. Clay soil has potential in fungal biofabrication, although its impacts on fungal metabolism need to be studied further. In the wild, saprophytic fungi can forage for food between soil and litter levels yet commercially available clay could be a poor fungal substrate due to its high-density microscale particles and varied chemical flora. In 2022, introduced honeybees failed to establish themselves in the mycelial clay hive. Our best predictions are the material itself, the gaps between ring modules created by physical deformation, and the no-basis for the bees to build their cells.

IMAGE 6 & 7. Hive parts after 14 days of growth. This phase is further explained in the instructables link step 8 (photo credit: Asya Ilgün)

The fifth iteration of the hive included minor adjustments in its dimensions and material topology to allow us to put honeybees into the cavity and insert wooden frames to boost the likelihood that they will create their nest without too much stress. This is particularly because we needed a biological evaluation of the form's acceptability and what the non-inert mycelia may bring into the honeybee cavity, not an evaluation of the practical usability of the hive. We used PLA-based thermoplastic-wood composites. Although its delayed biodegradability creates environmental issues, PLA bio-scaffolding, especially when combined with lignocellulose, provides a long-lasting framework for honeybees and mycelia.

We introduced a queen and workers in this last prototype on 27th July 2023 by directly transferring two modified frames with brood and honey cells from a pre-established colony in a Zander hive. We employed wireless sensors to measure temperature and humidity and compared them to a nucleus hive that acted as a control. In comparison to the nucleus hive and conventional benchmarks, our observations revealed increased humidity in the mycelial hive. However, the varied sensor locations - across the

IMAGE 8. Cross section of the basic mycelial beehive scaffold and photographs of the marked areas. These locations are intended to play an active role in establishing symbiosis between honeybees and mycelia. More information is provided in step 9 of the Instructables post (image credit: Asya Ilgün)

plane of the frame in the mycelial hive and on top of the hanging frames in the nucleus hive - may have an impact on the scientific correctness of our findings. During the first month of the hive, snails plucked mushroom fruits and coated the hive scaffold with slime. Ants, moths, and red beetles visited the mycelial hive, yet no ants nested within. After a woodpecker destroyed the roof, we made a new roof part.

The bees are currently overwintering in the hive. In warmer weather, we will open the hive and assess their survival and activities. Despite obstacles such as mould and animal interactions, the hive's environmental dynamics, notably the increased relative humidity, show potential climatic benefits for honeybee health.[21] In the approaching season, we want to further assess the hive's suitability for beekeeping.



WHAT TO FOCUS ON IN THE FUTURE?

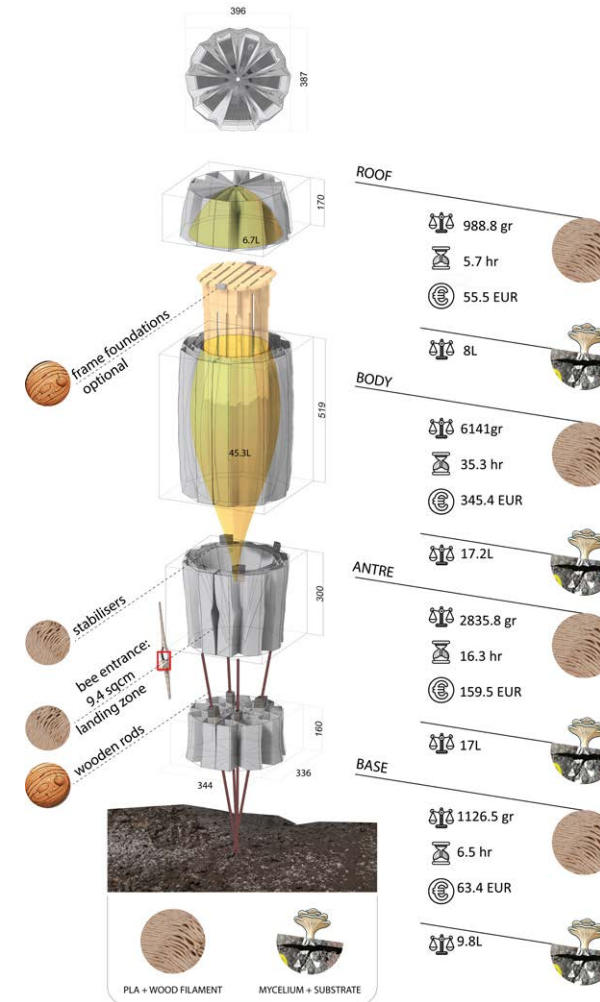
With the long-term possibilities of the HIVEOPOLIS project in mind, we encourage the application of mycelium-grown beehives and leverage on their potential for bee health and ecological sustainability. To help this design and field progress, we suggest focusing on the following areas:

- Medicinal fungal species integration: Exploring the use of medicinally potent fungi like *fomes fomentarius* to create therapeutic beehive materials. This could reduce the need for intrusive bee medicines. Though initial stages may require sterile conditions and more energy, research into fermentation techniques and substrate types could make this viable.
- Cultivation from local native trees: Investigating the isolation techniques of wild specimens from local native trees to make mycelial materials.
- Engineering mycelial growth for hydrophobia: The goal is to create a hive where the inner nest area has higher water absorption, while the outer areas are more hydrophobic. This can be achieved by adjusting material properties and using 3D-printed scaffolds for enhancement.
- Biowelding (different parts growing together) improvement: Refining the bio-welding protocol to create stronger, monolithic structures. This would enhance the durability and integrity of the hive.
- Field testing and digital fabrication: Conducting

extensive field testing and utilising digital fabrication for rapid production and mass customization. Algorithmic design can facilitate quick adjustments in design parameters.

- Advancements in 3D printing: Progressing in 3D paste printing techniques that eliminate the need for plastic and exploring multi-material printing for controlled durability and biodegradation.
- Design modelling: Addressing the structural stability issues caused by organic deformation. The design needs to prioritise structural integrity while maintaining low weight. This involves rethinking the thickness of walls for thermal insulation and overall hive shape, which may lead to larger, more spherical, or taller structures with potential vertical stability challenges. Improving the hex-weave technique for versatility and speed and enhancing joint connections for stacked components.
- Custom feeder & bar frames: Designing a custom feeder and integrating top bar frames with an observation window can minimize the need for comb removal during inspections.
- Scaffold protection: Developing strategies to protect the hive from external threats like

IMAGE 9, 10 & 11. Clay mycelial beehive of HIVEOPOLIS. Left: Summer of 2022 in the Botanical Garden of University of Graz. Middle: Looking inside the hive cavity towards the entrance hole with a queen excluder mesh. This was an intrusive last resort to encourage the queen to stay in the hive. Right: Winter 2023, clay hive is coated with gypsum and straw mixture to seal the gaps occurring between the ringlike parts (Photo credit: Asya Ilgün)



woodpeckers and mice. This could involve designing a new base to elevate the hive or improving the wooden stick insertion method.

- Comprehensive monitoring: Integrating multiple environmental sensors in various locations inside the hive can be explored to allow detailed investigation on internal processes related to both bees and mycelial composite and better support the biohybrid symbiosis. In addition, implementing more advanced sensing like visual monitoring can help extend the reach of monitoring to the wider ecosystem.

IMAGE 12. Exploded isometric Drawing of the most recent iteration of the Mycelial Hive (image credit: Asya Ilgün)

CONCLUSION

In this article, we discuss biohybrid architecture and its potential to rehabilitate disturbed ecosystems. How can we reconstruct nonhuman habitats and improve interspecies interactions? Biohybrid systems and interdisciplinary methods like material science, biotechnologies, design modelling, and synthetic biology may allow us to restore healthy environments and reduce biodiversity loss in ecological networks quickly and effectively. Such technologies not only provide a means of restoring what has been lost, but also pave the way for a more robust and diverse society in which the nature-culture divide may become outdated.

For effective visual monitoring of beehives, one could consider an operable window on the hive body, like tree beekeeping hives. Alternatively, redesigning the hive for modular frames could be explored. However, this raises a question: Would altering the design affect the authenticity of the results? This dilemma is at the heart of animal-centric and experimental design – balancing the original design concept with practical functionality for biological assessment. In this context, the behaviour of bees raises pertinent questions. Will they build their own comb without frames? Is the mere attractiveness of a cavity sufficient for a swarm to choose it as a new home? These inquiries extend beyond mere design – they touch on the inherent behaviours and preferences of the bees themselves.

Our fundamental premise is that hybrid building techniques may generate self-sustaining habitats without harming the species involved. However, ecosystem-ethically, and culturally integrated biohybrid designs face challenges including varying biological life histories and shorter material life cycles. This calls for the complexification of life cycle thinking in design, highlighting their integration despite constraints. Designers must find overlaps in many biological and ecological life cycles to reestablish these relationships. Investigating engaged creatures' life cycles in their primary environments reveals the 'know-why' and 'know-when' of design interventions. This knowledge was essential for creating multispecies biohybrids like our HO mycelial beehive.

The distinction between seasonal life cycles and life history suggests that traditional beehive designs, which are typically "hard physical boundaries", may not adequately engage with ecosystem networks, preventing them from benefiting from biological diversity. The data and perspectives from an interdisciplinary project team of biologists, designers, and engineers simply led to further hypotheses in this study. These hypotheses remain speculative for this epistemic artefact to become practical technology and require continual monitoring and inquiry, especially in material and geometric design.



Only specific aspects of this cyclic intervention have been studied, and further evidence-based study is needed to harmoniously integrate this hive design into honeybee life. Thus, the designs, research findings, and building instructions offered here show progress and suggest further design advancement.

To illustrate this complex design problem, we utilised a musical canon comparison. By including factors like time, melody, looping, variations, and continuity, this comparison communicates ecological design. Yet, more imagineering tools, we perceive, are needed to help designers connect with dynamic systems and understand the nonlinear and time-dependent connections that present in ecological systems. It is much more pressing in a profession like architecture, which is often a static design challenge of human building.

Aside from the creation of the material artefact, the technical design procedure must allow for continual modifications with the capacity to reflect local conditions and allowing for interactions between the environment, materials, and residents. In hive design, we indicated it by making the design model open source and editable. Since we know that the

geometrical or material composition of this hive is not harmful to the honeybees, we may leave certain aspects fixed and continue investigating the overall design concept in community. When addressing this problem together, design representation and hypothesis are of paramount importance. As a result, this paper should be utilised as a reference for future iterations of this hive design, as well as for those adjusting the hive design and operations to ensure that minor changes in bee population, floral supply, or climate conditions do not result in system failure.

Prior to the reliance on fossil fuels, collective and natural construction approaches based on integrating architectural designs with the planet's ecosystems were typical. With the advancement of technology and increasing knowledge available, we now have the chance to incorporate these methods more successfully, providing promise in tackling ecological challenges. Finally, the hive design serves as a case study, demonstrating the possibility for future design improvement and emphasising the critical lessons in designing successful interventions in ecosystems for rehabilitation and futureproofing.

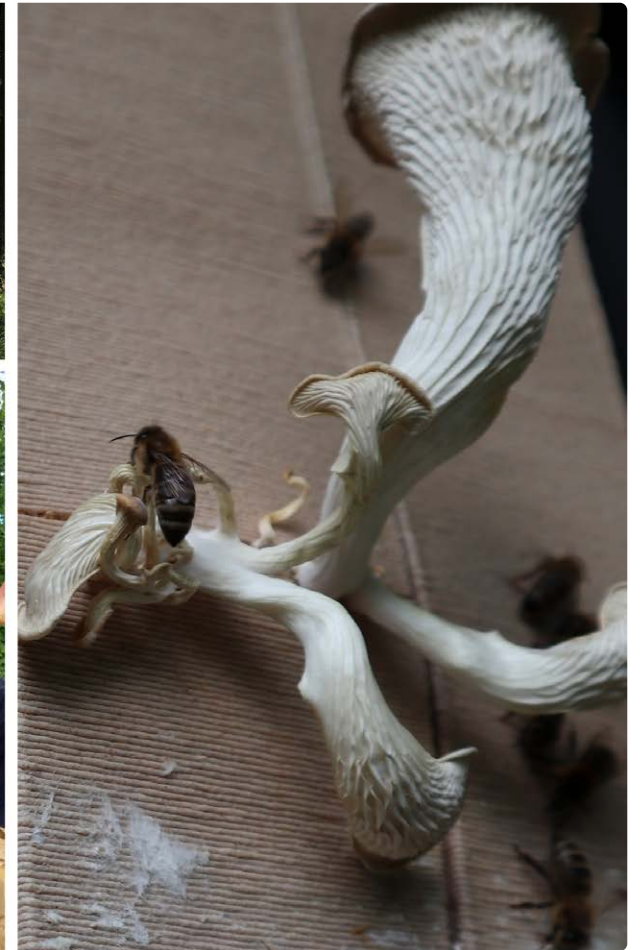


IMAGE 13. A photograph of the beehive in the garden of University of Graz on the same day that the honeybees were introduced, 27th July 2023 (Photo credit: Josiah Stelzer) (image credit: Asya Ilgün)

QR CODE. Visit the Instructables post to create 3D-printed and mycelium-grown beehives.



IMAGE 14, 15 & 16. Collection of images after the honeybees settled in the mycelial beehive. Left top corner: Right after the honeybees were introduced in the beehive at the Honeybee Field Lab, Botanical Garden of the University of Graz. Right: The oyster mushrooms outside hive on the second day, before other animals removed them (Photo credit: Asya Ilgün). Left bottom corner: Asya is investigating if there is enough honey stored by bees before winter (Photo credit: Anneke ter Schure)

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References

Chapter 01

Commoning approaches to combat the scarcity myth: Designing with abundance

Interconnected Wave

pp. 12 *Federica Mandelli, Line Ulrika Christiansen*

1. Design thinking expanded the idea of “design” and turned the designer into a “goddess of answers”... although the intentions may be good, it has been shown that design thinking falls short in the execution and aftermath of an innovation.

2. Today, it is no longer about 'doing things well', but about creating what people desire and need. The key is to involve people in the decision-making process, understand their behaviour and measure their interactions.

3. “There’s nothing worse than the quick and dirty one-night stand of speculative participatory design that says, “We will help you think about the future and then we will f*** off...” - Matt Ward

Circular Design Journal for Makers

pp. 18 *Therese Balslev & Joanna Kowolik*

1. The Circular Design Journal for Makers is designed to enhance awareness and provide tangible strategies for circular design, particularly in the early stages of product development in makerspaces and fab labs.

Project Reflect

pp. 22 *Angela L. McKee-Brown*

1. Joy is a source of power for our communities — a way to connect us to one another in order to create a more just society.

2. When there is abundance (enough for oneself and enough to share), confidence (trust in the design), care (intentional support), and consistency (adaptability and durability), the result is an experience that is protected and spacious, ripe for the existence of joy.

3. By uplifting joy in design - and recognizing its ability to open portals to understanding what freedom, safety and ease mean for our communities- we hope to provide a tangible starting point for those who want to support meaningful systemic change but don’t know where to begin.

Pola പൊള

pp. 26 *Nanditha Nair*

1. Pola is a regenerative design method for transforming water hyacinth into bio-objects, illustrating the potential for invasive plants to be interpreted not as a nuisance but as a gift.

2. Collaborating with local NGOs, Fablabs, and women’s self-help groups, Pola integrates traditional craftspersonship and indigenous knowledge into its global sustainability narrative

3. Pola provides region-specific recipes and tools, facilitating independent production of biomaterials. The use of low-tech tools enables easy replication even in remote locations.

Creative Glass Serbia

pp. 32 *Hristina Mikić*

1. The essence of Creative Glass Serbia can be summarized in one slogan ‘From digitalization to revitalization’ where the development process was guided by the methodology of industrial forensics and incremental innovation in design.

2. The essence of the Creative Glass Serbia Initiative is the experimental glass Lab which operates as an open innovation platform and platform for democratisation of creative process. The Lab engages local communities with glassmaking tradition and creatives, designers and artists, helping them to discover sustainable and inclusive ways of living and eco-creative working with glass as a fully recyclable material.

3. Creative Glass Serbia is an initiative that connects glassmaking heritage heritage, creative industries, artist, designers and handmade glass production in Serbia and focuses on transformation of industrial glass heritage into an asset for sustainable and fair local development of the creative economy.

Bagaceira Project

pp. 38 *Julia Stekete*

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EXCERPT

1. Sugarcane is the world's largest crop by production volume and after sugar or ethanol production, up to one-third of the plant’s mass remains as bagasse.

2. Bagaceira Project crafts objects that embody this transformative spirit and invites others to turn trash into treasures for the built environment.

3. "You are responsible for what you put into the world" - Victor Papanek24

Bubble Trouble

pp. 44 *Faezeh Mohammadi and Sara de Boer*

1. A shift towards low-tech, low-energy solutions is needed, challenging the belief that technological progress and sustainability are inseparable.

2. Communication is key! Designers need to tell compelling stories about their work to engage a broad audience and shift mindsets. Understanding who they’re talking to and crafting tailored narratives is crucial.

3. By aligning designers with institutions, we can influence policies and practices, paving the way for a future where sustainability thrives.

Prefiguring Emergent Futures in Learning Practice

pp. 58 *Maria Dimitriou-Tsaknaki and Leo Stillinger*

1. By turning theoretical descriptions into lived experience, the summer school showed what the concrete practice of degrowth can look like.

2. The summer school taught what a de-automated learning process can feel like: risky and uncertain but also rich and exciting, filled with singular opportunities. In a world where full control appears less and less likely (if it were ever possible), the art of designing in organic, responsible, flexibly structured ways appears more important than ever.

3. The possibility of another world might just be connected to the future of the relationships we build.

Chapter 02

From prototypes to possibilities: Democratising design through learning

Fostering Learning Environments for the Future

pp. 66 *Amy Gowen*

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EXCERPT

1. Despite taking its form as a School, SoC stands apart from traditional educational structures in that its content and direction are not predetermined by a fixed program or curricula. Instead, they are shaped by the collective know-how, ways and workings, aspirations, and curiosity of its dedicated communities.

2. Within the SoC learning environments there are clear links between each of the above infrastructures, as rather than being standalone substrates, they work best when informing one another, as part of a networked infrastructure of togetherness.

3. Commons infrastructures are not only based on sharing and exchanging, for instance with resources and knowledge, but also on the acknowledgement of difference and conflict.

4. It is through the large scale, identifiable commoning activities, such as public workshops, cross-cultural collaborations, open-source documentation, publication contributions and ways and workings activations that the commons is seen within SoC.

Counter-Hegemonic Pedagogy within Dominant Design Education

pp. 74 *Chiara Del Gaudio*

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EXCERPT

1. Design Education emerges as a crucial arena for transformation, as its day-to-day activities consistently perpetuate harmful design practices.

2. How can we, therefore, incorporate non-hegemonic design approaches into present-day Design Education?

3. The absence of theoretical readings and the failure to connect theory and practice hindered the understanding of Design’s potential for critical thinking and societal change.

4. It is the time dedicated to discussing the politics of Design that facilitated a deeper understanding of the nature and implications of design practice, encouraging the acceptance of new and diverse approaches.

Fab City Challenge: Driving Global Innovation through Local Impact

pp. 80 *Mitalee Parikh, Daan Sonnemans, Josefina Nano*

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EXCERPT

1. The co-creation and curation phase builds a significant foundation of the Fab City Challenge, empowering hosts with essential skills, resources and people to tackle complex challenges.

2. Documenting and disseminating intricate challenge processes and outcomes facilitates knowledge democratization, fostering collaboration, innovation, and collective learning.

3. [The Fab City Challenge] exemplifies collaborative problem-solving, blending local wisdom and global expertise to drive positive change and foster inclusive, sustainable futures.

Fostering Open and Distributed Design in Early Design Education

pp. 86 *André Rocha*

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[16] https://bytheendofmay.com/

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EXCERPT

1. “The School of Education at IPL, housing Fablab Benfica and the Visual Arts and Technologies (AVT) BA program, has become a fertile ground for this educational evolution. The period from 2018 to 2023 marks a significant time in which the product design programs within this BA underwent a fundamental change in their approach to teaching product design. The program has embraced a more open and diverse framework, aligning with Distributed Design principles and moving beyond conventional design processes and goals primarily aligned with traditional industry goals.”

2. “The correlation between the maturity of the Distributed Design Platform and the improvement in the quality of student projects is particularly noteworthy. The enhanced participation of students in both local and global Distributed Design activities suggests a growing appreciation and application of Distributed Design principles. This increased engagement has led to more sophisticated project outcomes, signaling a successful assimilation of Distributed Design into the students' design thinking and processes.”

3. “The introduction of Distributed Design was observed to enrich the conventional understanding of product design, offering students a broader perspective that transcends traditional industry-focused approaches.”site/149944b8b2664636a239e6d1c9d71e14?v=e687830d86894a17a826d7f1d36a128c.

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Soft Circuits Toolkit

pp. 96 *Catharina M. van Riet, Shibo Zou, Johannes T.B. Overvelde, and Frank L.M. Delbressine*

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EXCERPT

1. The Soft Circuits Toolkit allows anyone to prototype fully soft circuits that work on air instead of electricity.

2. We hope that the toolkit will inspire users to dive further into design, engineering, and soft robotics more specifically.

3. Youth greatly enjoy building the circuits and learning from them. They can understand the concept of airflow and apply it to the circuits they are building.

4. One of the main goals of our project is to make it completely open source, so that anyone in the world can download the files and make their own toolkit, and even better, contribute their own designs to it.

Circular Cities Challenge

pp. 102 *Fab Lab Barcelona at the Institute for Advanced Architecture of Catalonia*

1. Barcelona, a hub of innovation, design, and knowledge, is gradually embracing regenerative and circular practices that promote resilience and prosperity for all.

2. Creative Talents collaboratively ideated and prototyped proposals using a combination of approaches and processes including digital fabrication, traditional crafts, electronics, and biomaterials.

3. ...the prototypes Talents developed serve as interactive and replicable examples of the circular economy that encourage industry, policy makers, and citizens to envision alternative responses to traditional waste challenges.

Africa Open Science & Hardware (Africa OSH)

pp. 110 *Frank Bentum*

1. Africa OSH is a grassroots movement that promotes open science and open hardware initiatives across the African continent.

2. Africa OSH is involved in initiatives that are dedicated to developing the capacity of individuals in open science and hardware.

3. Africa OSH seeks to create a collaborative ecosystem where individuals and communities can work together on open science projects.

Crafting Inspirational Spaces

pp. 114 *Julia Leirado, Santiago Fuentemilla, Xavier Domínguez*

1. Every student, classroom, educator, and learning community is unique. Learning spaces designs should be, too.

2. Classrooms and schools are places of creation, as creativity is inherent in children’s nature. However, the materials and tools available to them from the age of 3, when they enter kindergarten, to 17-18 years old, vary very little, even though the tools themselves have the potential to become learning materials.

3. When adapting classroom space to make it more conducive to maker education and creativity, the digital fabrication technologies chosen should be the most accessible and affordable.

Manifesting Chimeras

pp. 128 *Mathilde Lasnier Guilloteau*

[1] Mathilde Lasnier Guilloteau. Fungi+Plastics = <3. Collaborative design for coliving in queer ecologies. MfA thesis. (Linnaeus University, 2022).

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[5] Heather Davis. Plastic Matter. (London and Durham: Duke University Press, 2022).

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EXCERPT

1. A mycelial practice of design acknowledges its situatedness and the entanglements it is part of.

EXCERPT 2: What do fungi have to do with design? So much.

EXCERPT 3. Designing within queer ecologies means reconsidering hosting and caring through the prism of multispecies practices, which urges to step back from the front of the scene to deploy togetherness – and by doing so make space for fungi and for other creatures.

EXCERPT 4. Collaborative design thrives on the multitude, for it brings together different people, groups, entities, and creatures – all looking for something they have in common, how to reach a compromise, and how to make something together.

EXCERPT 5: The queer, the creature, the odd one is often considered other and antagonised when they have always already been there.

EXCERPT 6: As a designer, before even diving into the project, this also involves reconsidering how much I can actually (anthropo-)de-centre myself, and how willing I am to give up the boundaries of human exceptionalism and domination.

EXCERPT 7: Caring for your waste instead of feeding the cycle of displacement is possible when a relation of care is developed and adapted to daily life...

I Grew Tired of Radical Education

pp. 138 *Engy Mohsen in conversation with Mohamed Abdelkarim, Huda Zikry, Batool El Hennawy and Hussein El-Hajj*

[1] The Roznama Studio Program was designed and led by Mohamed Abdelkarim, Nour El Safoury and initially Ahmed Badry.

[2] Didem Yazici, Heba Farid and William Wells alongside Medrar for Contemporary Art—the art space organizing the annual competition and exhibition.

[3] Sara C. Motta. (2012). Nottingham Free School: Notes Toward a Systemization of Praxis. In: Robert H. Haworth Anarchist Pedagogies: Collective Actions, Theories, and Critical Reflections on Education. USA: PM Press. 145 – 161.

[4] All conversations in this text were recorded, and later on freely translated and edited for brevity and clarity.

[5] Engy Mohsen is an artist and curator currently based between Zürich and Cairo. She took part in various independent study programs, namely Roznama 6 - Studio Program (2018), MASS Alexandria's Independent Studio and Study Programme (2018/19), Artists for Artist's Masterclass: Radical Care (2020), and School of Commons (2022 - 2023). She is one of the co-founders of the artist group K-oh-llective.

[6] Mohamed Abdelkarim is an artist, performer, filmmaker, and researcher. He has a performance-oriented practice. He was one of the programmers of the first and second editions of the Roznama Studio Program. He received his MA in Arts in Public Spheres from édhéa /ecav, Switzerland (2016), and is currently a Ph.D. candidate at the Akademie der bildenden Künste in Vienna.

[7] Found on the Facebook page of StudioKhana for Contemporary Art, February 14, 2022.

[8] Huda Zikry is a visual artist and researcher interested in contemporary art history, art education, and translation. She joined Studio Khana for Contemporary Art and Cultural Development (2016). Since then, she has worked on designing and facilitating three editions of the annual Student Council program, and the culminating group exhibitions.

[9] As part of Another Roadmap for Art Education, the group consisted of Nour El Safoury, Hussein El-Hajj, Rana ElNemr, Andrea Thal, who focused on researching local histories of arts education and plotting alternatives.

[10] Batool El Hennawy is an artist and writer. She studied at the Faculty of Fine Arts, Helwan University. She worked at CILAS in Cairo and Alexandria (2015 - 2019). She has joined various art institutes and educational initiatives in Cairo, Alexandria, and Amman as a curriculum designer, artist, curator, consultant, and researcher.

[11] Hussein El-Hajj is an activist and researcher. He is the current coordinator of CILAS in Cairo and the founder/director of CILAS in Alexandria, where he is also teaching. Hussein has contributed to “Another Roadmap School”, an international platform that provides open spaces for trans-regional exchange and learning in arts education as an engaged practice committed to social change.

EXCERPT

1. All I could remember was the amount of times I had to read the phrase ‘Radical Education’ in one of the texts... I wondered whether the repetition helped stress the meaning, or rather drowned it in mere redundancy.

2. I always asked myself radical in what way. I always asked myself what alternative to what.

3. I felt that by having these conversations, I would come closer to any answers. After all, these are all people that I shared personal learning experiences with.

4. I am tired because I have failed to come closer to understanding the paradoxical relationship between language and knowledge.

Acción Veredas | Paths-Action

pp. 142 *Arianna Mª Fanio González; Carlos Jiménez Martínez; Jorge de la Torre Cantero*

[1] Dougherty, Dale. 2012. "The Maker Movement." Innovations: Technology, Governance, Globalization 7, no. 3 (2012): 11-14.

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[5] Hatch, Mark. 2014. The Maker Movement Manifesto. New York: McGraw-Hill Education. ISBN: 978-0-07-182113-1.

[6] AA.VV. 2017. Deconstruyendo el Manifiesto Maker. Barcelona: Transit Projectes. ISBN 978-84-697-3041-6.

[7] Ciencia ULL UCCI. "La Baldosa Hidráulica, ¿una artesanía perdida?" YouTube video. September 23, 2021. https://www.youtube.com/watch?v=DwD3dkPxs8g.

[8] Estudio Valija. "ANDA". Accessed September 2021. https://estudiovalija.com.ar/anda/.

[9] Fanio-González, Arianna; Jiménez-Martínez, Carlos and de la Torre-Cantero, Jorge. "Recursos en abierto para el diseño y la fabricación de baldosas hidráulicas en el aula," University of La Laguna, V1 (2023), https://doi.org/10.17632/zwh82zcbyr.1.

[10] Arimfg. "Baldosas Hidráulicas Canarias." Pinterest. https://www.pinterest.es/Arimfg/baldosas-hidráulicas-canarias.

[11] Acción Veredas. "Proceso de aprendizaje compartido en torno al diseño de una alfombra de baldosas hidráulicas" YouTube video. May 10, 2022. https://www.youtube.com/watch?v=0uExnmZ2utc.

[12] BID-DIMAD. "Acción Veredas: Aprendizaje y Patrimonio." Décimo encuentro BID enseñanza y diseño. Accessed November 17, 2023. https://bid-dimad.org/encuentrosbid/decimo/talentos/ull_accion-veredas-aprendizaje-y-patrimonio.

EXCERPT

1. The project aims to highlight the value of the declining heritage of hydraulic tiles in the Canary Islands.

2. We create a workshop that combines heritage conservation with educational community participation and the promotion of new forms of creation.

3. To act as a bridge between the local and the global, creating significant experiences in the territory that generate resources accessible worldwide.

Found Objects

pp. 148 *Jesse Howard, Marije Remigius, Iñigo Puerta Uranga and Paola Zanchetta*

1. ...an average of 30% of sheet material processed by CNC ends up as waste. For Fiction Factory, this means that they throw away an equivalent of 2,000 sheets of new material every year.

2. Collaboration has been the essential element driving the Found Objects project development from the very beginning.

3. We believe that what we treat as waste today could be seen as a resource, and systematically become a new raw material tomorrow.

4. Found Objects is a project that breeds new ways of working, thinking, and valuing circular techniques, in order to produce technologies locally, which if distributed, will have a global impact of change for good.

Chapter 03

Living with worlds: Ecologies of practice and kinship

Fouté-Difé

pp. 158 *Emma Bereau*

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[2] Odin, P. (2019). Pwofitasyon: Luttes syndicales et anticolonialisme en guadeloupe et en martinique. La Découverte.

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[6] http://guadeloupetraditions.free.fr/carnavale.htm

[7] http://guadeloupetraditions.free.fr/carnavale.htm

[8] Glissant, É. (1990). Poétique de la relation. Gallimard.

[9] Glissant, É. (1990). Poétique de la relation. Gallimard.

[10] https://traditionsamoun.com/culture-et-traditions/le-fouet-tout-un-symbole/

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[12] Mulot, S. (2003). La trace des Masques. Ethnologie française, 33(1), 111. https://doi.org/10.3917/ethn.031.0111

[13] Glissant, É. (1990). Poétique de la relation. Gallimard.

[14] Mulot, S. (2003). La trace des Masques. Ethnologie française, 33(1), 111. https://doi.org/10.3917/ethn.031.0111

[15] Laumuno, M.-H. (2011). Gwoka et politique en guadeloupe: 1960-2003 : 40 ans de construction du pays. Harmattan.

[16] Laumuno, M.-H. (2011). Gwoka et politique en guadeloupe: 1960-2003 : 40 ans de construction du pays. Harmattan.

[17] drum player in Créole

[18] Marcin, F. (2016). Le gwoka à l'heure de l'Unesco: entre reconnaissance et interpénétration culturelle. In J. K. Dagnini (Ed.), Musiques noires: L'Histoire d'une résistance sonore (pp. 253-276). Camion blanc.

[19] In March 1685, an ordinance prepared by Colbert and his son, was promulgated to clarify the legal status of black slaves.

[20] Laumuno, M.-H. (2011). Gwoka et politique en guadeloupe: 1960-2003 : 40 ans de construction du pays. Harmattan.

[21] Camal, J. (2011). From Gwoka Modenn To Jazz Ka: Music, Nationalism, and Créolization in Guadeloupe (Doctoral dissertation). Washington University.

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[27] https://www.guadeloupe.franceantilles.fr/actualite/culture/les-mas-vyefo-notre-plus-vieille-tradition-carnavalesque-398275.php

[28] https://www.kariculture.net/mas-vyefo-invites-montserrat-5e/

[29] Sugar bags

[30] http://www.lameca.org/publications-numeriques/conferences-audio/rencontre-autour-des-mas-vyefo-ou-masques-de-vieux-fort/

[31] Jolivet, M.-J. (1997). La créolisation en Guyane [Un paradigme pour une anthropologie de la modernité créole]. Cahiers d'études africaines, 37(148), 813–837. https://doi.org/10.3406/cea.1997.1834

[32] In the sense in which the term is used in the French overseas departments, i.e. on all fronts (administrative, legal, etc.) including that of culture - it can also be referred as Westernization.

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[34] Schoelcher, V. (1984). Des colonies françaises: Abolition immédiate de l'esclavage. Edition et diffusion de la Culture antillaise.

[35] Pavy, F. (2021). Le Mas de Voukoum ou la genèse d'un rite oublié: Un dispositif rituel de transformation des corps et des esprits au cœur du carnaval guadeloupéen [PhD thesis, Ecole des Hautes Etudes en Sciences Sociales (EHES)].

[36] https://www.voukoum.com/

[37] https://www.voukoum.com/mas-a-konn

[38] Ganem, V. (2010). Retour sur le « liyannaj kont pwofitasyon (lkp) » accompli en guadeloupe. Nouvelle revue de psychosociologie, 9(1), 199. https://doi.org/10.3917/nrp.009.0199

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[40] In terms of internal organisation, women with children are better represented on the Board of Directors and on certain committees, in particular the Economic committee, which is essentially run by women.

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IMAGE

1. Monument of the drummer Marcel Lollia, known as "Vélo", in Pointe-à-Pitre, Guadeloupe (November 16, 2016. (https://commons.wikimedia.org/wiki/File:161116_Marcel_Lollia_Guadeloupe.jpg) Rennboot. CC-BY-SA 3.0)

2. Drum player, Paul Rastocle playing at an event (November 18, 2017. (https://commons.wikimedia.org/wiki/File:B%C3%A8l%C3%A8_Tradition_(3).jpg). Dalia Del Arte. CC-BY-SA 4.0 (https://commons.wikimedia.org/wiki/File:B%C3%A8l%C3%A8_Tradition_(3).jpg). Dalia Del Arte. CC-BY-SA 4.0)

3. Déboulé at Le Moule, Guadeloupe (February 10, 2019. (https://commons.wikimedia.org/wiki/File:Carnaval_Le_Moule_Guadeloupe_2019_01.jpg). CC-BY-SA 4.0)

4. Mas Vyéfo in the carnival in Basse-Terre, Guadeloupe (March 5, 2019. https://commons.wikimedia.org/wiki/File:Carnival_in_Basseterre,_Guadeloupe.jpg). Pkraemer. CC-BY-SA 4.0)

EXCERPT
1. When individuals grapple with an unclear understanding of their personal history or heritage, it becomes difficult to establish a sense of belonging.

2. Through the performances, costumes, and rituals of the carnival, the community engages in a continuous act of remembering, revisiting, and reinterpreting its history and identity.

3. ...to emphasize the importance of strong collective participation in this spontaneous carnival is to advocate self-affirmation of that same identity.

Seeds of Digital Reforestation

pp. 168 *Felipe Schmidt Fonseca*

[1] Refloresta. https://www.youtube.com/watch?v=YAQxp-rkFVM

[2] https://thackara.com/about/publications/

[3] https://www.youtube.com/watch?v=JDd7J-CLxg

[4] https://metarecyclagem.github.io/

[5] https://bristol.ac.uk/

[6] https://coletivoneos.org/instituto-neos/

[7] https://fonte.wiki/id21

[8] https://fonte.wiki/

[9] https://tropixel.org

[10] https://en.wikipedia.org/wiki/Plant_litter

[11] https://web.archive.org/web/20221108232246/https://twitter.com/diem_25/status/1581960992069517312

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IMAGE

3. Graphic documentation of Tropixel Semente by [Marina Nicolaiewsky](https://marinanica.wixsite.com/vida).

4. ID21 study. Report available [here](https://archive.org/details/ID21_0-5/)(PDF, Portuguese).

5. Sample of contents in fonte.wiki

EXCERPT

1. The way forward would be the complex and continued weaving of ultralocal initiatives that understand the conditions, culture, needs, and

dreams of their immediate contexts.

2. The idea of thinking about technology and culture as supporting the emergence and regeneration of life is not new... It is not about DNA conservation, but rather it’s remixing with the present environment. The seed speaks of diversity and multiplicity, not repetition.

3. With semente, we take a different path... Our bet, on the other hand, is to always start observing and creating relationships, discovering who the community is in all its diversity of knowledge, aspirations, and levels of involvement – our dense and complex forest – to collectively build what we want to be together.

Decolonial Futures

pp. 174 *Nyangala Zolho, Zinzi de Brouwer*

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EXCERPT

1. Ritual and ceremony serve as tools to locate the past, situate the present and shape the future. As we reflect on the practices of embedding futures with ritual, we come to the importance of manoeuvring through liminal spaces.

2. In beingness, we attend to our lives with care and attention, during times of great upheaval and during peaceful times.

3. Beingness, therefore, could be regarded as an act of sitting with the uncertainty that prevails in the Anthropocene, yet allows us to reckon with the magic within, in which new ethics of love allow us to walk the path of Earth- and Wisdomkeepership of our times.

os*tomy

pp. 182 *Nikolaus Potapow*

1. Recognising patients’ great dependency on donations, as well as the impact current practices have on the environment meant a clear call to action to design a system for a market that has as of yet been neglected.

2. Holistic thinking brought up seaweed-based polymers as a resource that does not consume any arable land while having a positive impact on the oceanic climate during growth.

3. os*tomy is not only a safe and sustainable medical product for colostomy patients, but an accessible set of knowledge and tools that empower communities to help the ones in need.

. Putting os*tomy into practice also builds knowledge: as an open-source platform, communities might develop it further, adapt it to patients needs and share their knowledge amongst themselves.

Eat me eat me not

pp. 188 *Manuela Viezzer*

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EXCERPT

1. Eat Me Eat Me Not was developed with the aim to influence players, make them think about what is really going on when animals are exploited within intensive farming, and eventually stir their behaviour towards veganism.

2. Games can be powerful tools to involve players and inspire them to think in novel ways. They can also be designed with purposes other than entertainment, for example with the aim to raise people’s awareness around certain topics and to encourage making certain desired choices in the real world.

3. ‘Making kin’ encourages thinking beyond species-specific and is a reminder that all earthlings are kin, in the deepest sense.

4. Making kin is a global practice rooted in localised practices.

Intercommunal Collaborations

pp. 192 *Zeynep Uğur*

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EXCERPT

1. Intercommunal Collaborations' role is providing a space for alternative visions rather than defining them.

2. Breaking the bubble of our current norms, the IC workshop provides the space to reflect upon our values and assumptions.

3. Intercommunal Collaborations is inherently rooted in the local context, providing space for a bottom-up worldviews to spark global change.

Disperse the Spectrum / Disperse the Spectres*

pp. 200 *Roc Albalat, Pau Artigas, Marc Padró, Marcel Pié and Daniel Pitarch*

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EXCERPT

1. Computer vision does not look at the world, it looks at images of the world. It is a new piece that fits into the tradition of the camera.

2. To shroud AI in secrecy is to mystify it, to prevent us from understanding that it is yet another twist in the logic of our society.

3. Generative tools can be interesting if we understand them as analysing training data, as a kind of distorted return.

Feminist Hardware: Making Printed Circuit Boards with Natural Clay

pp. 206 *Patricia J. Reis and Stefanie Wuschitz*

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EXCERPT

1. It is an open secret that the hardware in our smart devices contains not only plastics but also conflict minerals such as tungsten, tin, tantalum, silver and gold.

2. Heinz Lackinger is a pottery crafter in rural Austria who works with prehistoric techniques of firing clay in an open wood fire.

3. Feminist hacking as a methodology implies an unorthodox approach to electronics - queering, questioning and deconstructing biased tech culture.

HARBORS

pp. 212 *Vincent Guimas*

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EXCERPT

1. Access to the riverbanks is once again possible, allowing new experiments and open research to be undertaken by bringing together a wide range of expertise, providing a favourable framework for citizen and participatory science.

2. For HARBORS, design is conceived as the ability of creators to sew together Culture and Nature in an inspiring and very local way.

3. The workshop is at the heart of the HARBORS approach. It is the parliament of the hand, a space for learning and democracy in the service of commitment and inclusion.

The World as a Museum of Colonization

Carolina Almeida, Marielle Sam-Wall, Stella Dikmans

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EXCERPT

1. The world is a Museum of Colonization - you just don’t see it. All around us, in our classes, books, and built environment lay unquestioned narratives centering European perspectives. With Europe’s colonization of nearly 80% of the globe, an exclusive Eurocentric history has been elevated to a singular truth. The Museum of Colonization (MOC) exists to challenge this “truth” and exposes it as the singular “story” that it is.

2. BIPOC storytellers have long been missing from the design industry, their stories and knowledge unclaimed or absent so their ideas are co-opted into designs that fit colonial narratives. This leaves out the depth and historical perspectives that, through collaboration and equitable access, could truly contribute to sustainable change.

3. The use of comedy in MOC’s work serves a similar purpose, along with challenging colonialism, we hope to aid others to see decolonization work not as a burdensome task but as a fulfilling one that expands worldviews.

4. With our use of the term [museum], we propose the existence of a third type of museum: the realities we inhabit.

5. Storytelling is a powerful tool for breaking free from the confines of linear, singular narratives of the past, present, and future.

6. By participating and MOC-ing the past together, we created a space for people to imagine alternative futures and bring them forth together.

Chapter 04

Living with worlds: Ecologies of practice and kinship

Unveiling the Stigmas around Mental Health that Are Living in Our Data

pp. 240 *Alex Johnstone and Pau Aleikum*

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EXCERPT

1. It’s important to recognise that popular culture significantly shapes these biases that are inherent in AI systems.

2. We prompted an image generator to produce typical scenes from daily life, with and without the presence of mental disorders, for example, a woman in a party with depression, or a teacher with schizophrenia giving a class.

3. We often focus on how AI is trained on biased data, but rarely ponder on how these systems train us, shaping our decision-making processes.

“Rain” Watchers

pp. 244 *littlefishtino: Tino/Tianao Yu*

1. Nature is everywhere, and it’s always moving. By just being there, taking time to take a rest, surprises always come.

2. When you enter the space, or just think about it, time becomes raining, after the rain and waiting for the rain.

3. Maybe now you know you can watch the rain, will you try to smell the soil, or listen to the leaves? In the moment of now, we are nature.

Responsive Open Source Modular Housing Prototype | #ROSHOP

pp. 252 *Vuga William, Ira Emmanuel, Gama Richard, Gilbert Charles, Doreen Bazio, Timm Wille, Richard Maliamungu, Stephen Kovats, Peter Treuheit*

1. The housing prototype became a fusion of architecture and media.

2. Replicating this initiative in other areas holds the promise of transforming lives and fostering empowerment in communities facing similar challenges.

3. It is possible to take small action locally, with limited resources, and still have considerable impact on the climate fight.

Distributed Food Factory

pp. 258 *Massimo Bianchini, Lorenzo Silvestri, Luca Grosso, Laura Cipriani, and Stefano Maffei*

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EXCERPTS

1. www.polifactory.polimi.it

Nyári, the Summer Kitchen

pp. 266 *Veronika Róza Háló, Evelin Murczin*

1. ‘Nyári’, an experimental building, open-covered space, based on the summer kitchens and smokehouses from the 19th century, which besides cooking were the centre of community life.

2. ‘Nyári’ is an experimental reinterpretation of the smokehouses from the 19th century, designed to meet the needs of modern society.

3. ‘Nyári’, an experimental summer kitchen that aims to connect generations and build communities through a mindful approach to spending time in nature and socialising while preparing and sharing meals.

SalvageGarden Assistive Makerspace

pp. 274 *Saad Chinoy, Jang LeongChia*

1. Expensive, limited assistive tech? SalvageGarden champions open-source, local fabrication for affordable, personalized solutions.

2. SalvageGarden escapes ‘one-off’ charity, creating a recurring, inclusive space for hands-on problem-solving with persons with disabilities and their caregivers.

3. Openness and collaboration are key. SalvageGarden welcomes diverse voices through co-creation and iterative development in an accessible makerspace.

Designing Health

pp. 278 *Alexandra Antih Strelcova*

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EXCERPT

1. How can we reconstruct nonhuman habitats and improve interspecies interactions?

2. This shift in habitat raises considerations about animal welfare ethics, human-honeybee coevolution, and the role of design practice in this process, i.e. either aiding in promoting a healthy and mutualistic co-existence with these insects or exploiting them as farming equipment.

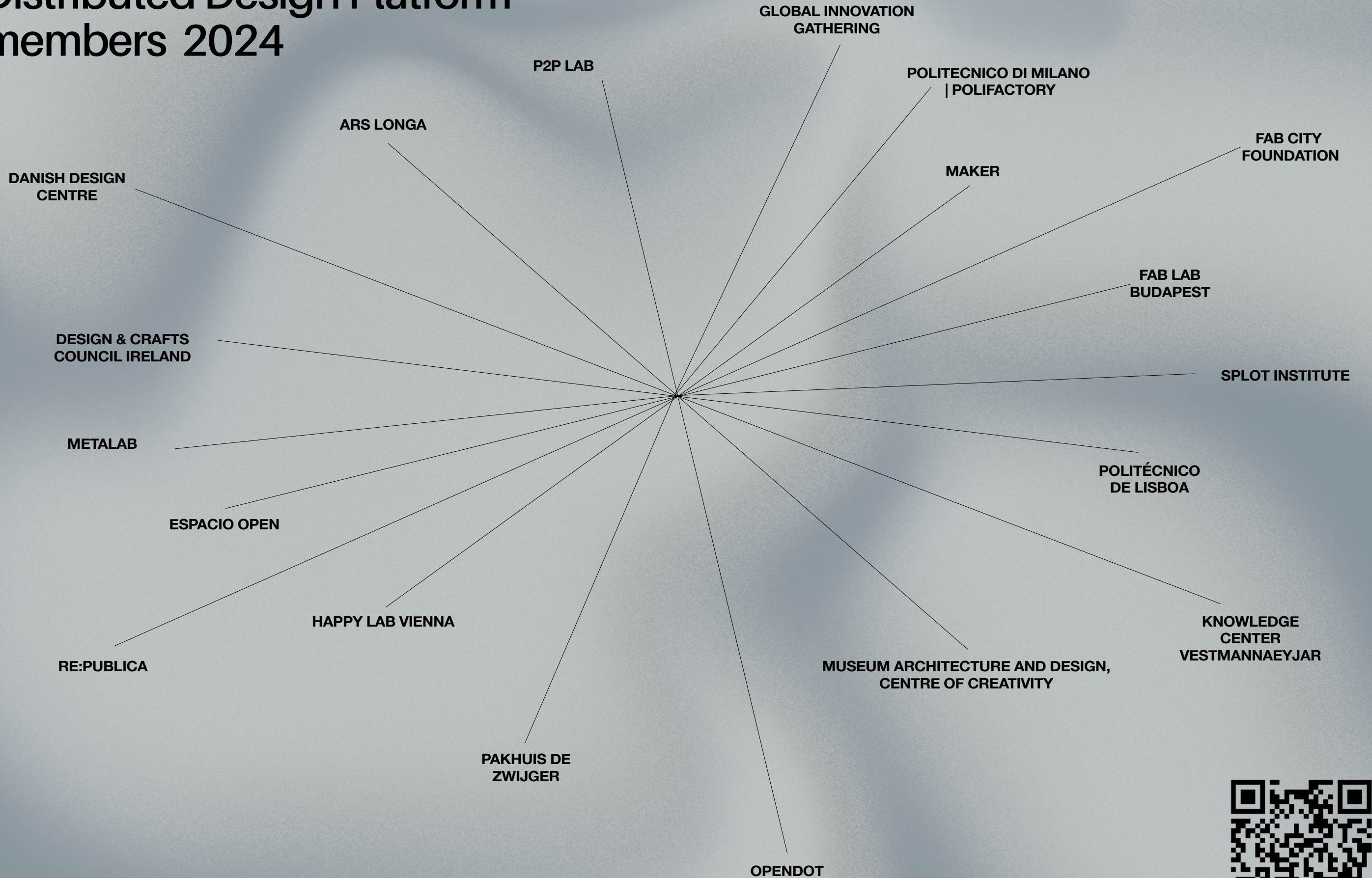
3. Biohybrid architectural systems include micro-ecosystems, which are smaller and more carefully defined networks of organisms that exchange energy and nutrients.

4: Like musical composition, biohybrid design activities have constraints and compositional elements. One or more melodies—organisms or abiotic factors—follow their own nonlinear trajectory at different speeds while interacting and overlapping.

5. This investigation is about more than just supporting honeybee survival and health; it is about redefining our relationship with the living environment, our socio-cultural context and recognising the interconnectivity of all living species.

6: Our goal is to provide this content to encourage the readers to try adapting their ideas and potentially employ regenerative making practices in their own regions, bringing this beehive concept to best practice communities where more ecosystem impact can be studied.

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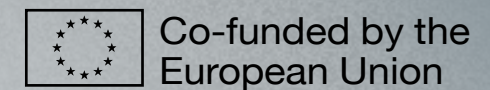
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Driving Design is the sixth of seven publications from the Distributed Design Platform. Established in 2017 and co-funded by the European Union, the Distributed Design Platform brings together Fab Labs, Makerspaces, cultural organizations, universities, and design centers from around the globe.

Driving Design is a non-exhaustive collection of articles, reviews, and profiles that represents and highlights the motivations, opportunities and challenges that drive the practitioners and the field of Distributed Design.

The book curates a collection of works under five umbrella themes, each of which offers the space for the Distributed Design community to share their vision, approaches and areas of exploration to answer who and what are the drivers of Distributed Design.

The chapters explore Commoning approaches to combat the scarcity myth; Designing with abundance; From prototypes to possibilities: Democratizing design through learning; Living with worlds: Ecologies of practice and kinship; From heartland to healing: Designs cultivating rejuvenation.

