Design Futures Literacies

VOL. 2
ESSAYS & REFLECTIONS

ED. ANDREW MORRISON

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FUEL4DESIGN

Future Education and Literacy for Designers (FUEL4DESIGN) aims at developing knowledge, resources and methods to help young designers designing for complex tomorrows. FUEL4Design builds on an extensive research programme conducted by leading universities and experts in Europe. Design futures literacies are a transdisciplinary mix of theories and concepts, methods and practices geared to support situated and resilient pedagogies for design students and teachers to engage productively and critically with the given and changing contexts and conditions of Design. This is a design that reaches beyond functionalism into the pragmatic and the imaginary. It works with a diversity of participants and interests. It aims to meet real world needs but to also reach beyond their constraints and conceptualisations to develop and sustain specifically design based literacies and competencies. These are mental, material, creative and critical skills that are enacted performatively. In doing so, we need to acknowledge and address the changing nature of futures where the temporal and spatial, social and political, economic and ethical are increasingly entwined.

Design Futures Literacies
Vol. 1 — Practices & Prospects

This collection presents ventures into futures in and through designing with master's and doctoral students. Included is an overview of current approaches and content on design education. There follows a group of overviews and reflections from FUEL4DESIGN that reveals novel and exploratory work carried out over a three year period. These insights provide the core for further repositioning of what design futures literacies and pedagogies might contribute to reconfiguring design education in times of uncertainty, challenge and change. With a process view on making, learning, teaching and knowing, Volume 1 also reaches into current and ongoing debates and shifts towards decolonising design education futures. It offers modes and means of addressing matters of power, inclusion and transformation of design universities and includes aspirations towards both imaginary and pragmatic designerly futures.

Design Futures Literacies
Vol. 2 — Extended Essays

The set of long-form essays gathered here complements the focus in Volume 1 on practices and prospects of futures in and through design learning, teaching and researching. Collaboratively composed, these essays span a range of themes from and beyond FUEL4DESIGN. Each essay addresses central issues and potential in seeking to identify and elaborate on directions to meet 21st century needs and contexts of changing 21st century design education. The essays make a novel contribution to synthesising and elaborating on a diversity of content, methods and potentials of transdisciplinary design inquiry. Individually, and as relational and rhizomatic whole, the essays provide a recursive orientation to anticipatory approaches to shaping futures design literacies and pedagogies.

Contents

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FUTURE EDUCATION & LITERACIES FOR DESIGNERS

Summary of FUEL4DESIGN

Background

The two volumes entitled *Design Futures Literacies* are the outcome of the Future Education and Literacies for Designers Project (FUEL4DESIGN). The project was developed by four European design universities and investigated the dynamics of futures design literacies through six distributed work packages. These consisted of experimental ventures into shaping relations between making, pedagogies and research. Spanning three years, FUEL4DESIGN was funded by the ERASMUS + Strategic Partnership Programme, aiming to support student and teacher competencies in an ongoing development of relations between design and futures.

As design is one of the few disciplines that work pragmatically and creatively with the future beyond the here-and-now, the project was seen as a means to building capacities, resources and creative critical engagement through which design Master's and PhD students and teachers might together shape their 'Design futures Literacies'. The project identified gaps in facilitating design competencies, fluencies and vibrancies (engagement). This was informed by exploring tangled relations, design roles and practices in navigating futures as plural, complex, contested and emergent.

'Anticipatory design pedagogies' were ideated and realised through sustainable, proactive, speculative and pragmatic preferred, plausible and potential futures. We addressed master's students' learning design-futures to enter changing 'industry' and public services. We underpinned doctoral level designers' training to become critical designer-researchers.

We supported students in taking care ahead of time via critical practice and informed action in situating 'what-if' modes of knowing. A medley of online, hybrid and in-place 'Design Futures Literacies' were embodied and critiqued to provide fuel for young designers designing for complex nearby tomorrows and long-term sustainability.

Objectives

We aimed to develop, test and implement new approaches and resources to provide learners and educators with innovative and adaptable tools to imagine, perform and enact a plurality of futures by design. This was to equip design learners and educators to deal with real-world issues on techno-digital futures, climate crisis, and political instability.

We further aimed to connect experimentation and design theory via invention, imagination, speculation, and through design making activities such as via prototyping, scenario building, and foresight. In the context of the COVID-19 global pandemic, intended objectives were adapted and configured to a pivot to digital delivery and didactics.

This heightened modes of online access, diverse representations, types of activity for learners and support for educators. We sought to facilitate of self-directed and digitally mediated pedagogies, exploratory encounters and courses, workshops and public events that embodied experimental, generative activity and action centred engagement and exemplars.

We kept to core aims to prepare, orient and activate design-futures learning for emergent conditions and changing contexts, where creative criticality could be realised, critiqued and anticipated further.

Implementation

We included a diversity of action-based learning resources in support of wider learning needs and goals in the context of specific sites of experimentation and implementation. We developed interplays between original print and face-to-face activities and materials and their digital access and activation. These were addressed through various interfaces, types of learning tasks, from small actions to wide reflections, and through teacher and tutor presence, online lectures and workshops.

Activities were supported via Zoom and Teams, using online tools such as Miro. IO1 and 2 activities ranged from card-based play in shaping world views on design projects to metaphors in shaping futures research reflections, not tied to disciplines or programmes. IOs 3 and 4 were congruent with design futures courses and used personal digital and multimedia 'diaries' and presentations and co-designing in Miro group work. IO5 supported methods for teachers and was connected to public events and training for their uptake of multi-pathway resources. In IO6 reflections included activities of co-writing and publication of a book, with reflection on the projects workings presented in related media rich and dialogical online and international events. We chose to divide this book into two volumes, for readability and in order to make connections between the two volumes of content.

Results

FUEL4DESIGN designed and trialled open access online and printable design literacies learning materials for master's and doctoral design students, located in contexts of uncertainty and change. We created a digital repository of futures design resources as plural, ethical and situated and enacted via self-directed, adaptive and transformative pedagogies.

This involved diverse student experience of encountering, using and adapting content, tools, methods and learning activities to needs, tasks and learning pathways. Novel tools, concepts and instances of how new critical creative knowledge exchanges were taken up and apart in near and long-term futures alternatives in an ongoing present. A design centred 'pandemic pedagogy', platforms, teacher support and events were achieved and analysed.

Outcomes included cases and critical reflections on what and how design futures learning may be advanced, in online-only and adaptive, responsive hybrid formats. Focus on relations of design and care, agency, time and situation via dynamic modes of address and articulation for civic, critical and creative worlding were included in these open access books. This positioned design futures literacies in wider societal, geopolitical and educational contexts.

About

For more about the FUEL4DESIGN Project, please see: **Link** ↗

ON THESE VOLUMES
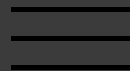
Motivations for publications

We've put together a thematic collection of the project's work packages and a set of inter- and cross-related position chapters and essays. Between us we produce and exchange experience and knowledge and we convey this in a variety of ways and fora, including formal research ones. We contribute to the ongoing professionalism of theoretical and applied design inquiry in a diversity of domains and collaborations. We are in the main committed to excellence in teaching and research and to their rich intersections that characterise much of what we achieve.

In composing what we needed to place in two linked volumes it has become clear that of all the fields of design research, the field that is least formally a part of most of our institutions in design, is design education itself. Yet, design education is the one shared domain and activity that fuels our schools. For this reason, these books focus on futures in design education.

The books include research inflected accounts of the project's workings and outcomes. They are, in a sense, heuristics or devices with and through which to think. The collection of work and reflections offer ventures and experiments, experiences and pathways. These have been intense, challenging and inspiring. We offer them not to lockdown 'a pandemic pedagogy' to offer a deliberative diagnostic for the future of design education. Instead, the publications are offerings of our experiments and ventures in bringing futures and design together and in looking to building relations design futures pedagogies

The books provide multi-level, multi-authored and multimodal reflections on ways design futures literacies have been conceptualised and realised in the FUEL4DESIGN project. As the project progressed, a set of linked online (in majority) resources were developed as a response to the conditions and constraints of a global pandemic lockdown. This was supported by a variety of modes of teaching, learning and communication about the work that was done that has contributed to the longer essayistic chapters in Volume 2.

Partial, not impartial

We are not impartial in what we have tried to do and claim to stand by and argue for, even though we have done this in a mode of making-inquiring-reflecting that is located in 'becoming'. We are partial to, the propositions, positions and practices we have developed and have been able to work with between us.

We work with, through and towards shaping relational links and affinities, and preferences. We are partial to some of these, but we offer them as another form of resource into design education and futures, mindful that we are only one project and four teams from four Europe-based design schools.

We've tried to convey and open out to some of our experiences. We acknowledge that our work has been difficult, entangled and risky. It's been motivated by our deep concern for our students and our colleagues and ourselves as professionals in a wider community of design education. That said, what we offer is a relational, not universal, account and gesture of sorts to a wider community of design learners, teachers and researchers.

Multiple audiences for the books

These two volumes have multiple audiences with varying interests and needs, from practice and pedagogy to research and reflection. The books are geared towards design educators, graduate students and design researchers who themselves also venture further into exploring anticipatory perspectives and practices around futures in design education and research.

The books will hopefully also especially be of interest to design educators and to researchers and policy makers of design. As we mention a few times in the introductory 'partial state of the art' on design education and futures and in the essays that follow, design universities are fuelled by design educators. We are a mix of practitioners and professionals, designer-researchers and researchers of design.

Our design pedagogies, and those that are anticipatory in stance and reach, are only possible because of the motivations and attention of our students. Master's and doctoral students might find parts of the books useful for specific parts of their own learning by designing and learning to design, research through designing and design research. Perhaps some of them might even be motivated to develop Master's and PhD theses in design education and its literacies and pedagogies. As motivation, you'll see we've included design work and research reflections from students who've contributed to the project and been connected to its events and specific domain area topics.

We hope that the books will also motivate our colleagues to value even further the intense, changing and demanding nature and substance of their own design pedagogies and to look to ways to perhaps draw on some of the primary and secondary material included and presented here.

A limited mapping, a massive field

We've tried to make connections to a diverse body of research and to position our ventures into design futures literacies in relation to other studies and reflections, inside and beyond design. It's not possible to cover the very many fields and domains that are covered in design schools, even though we have expertise in some of these, such as fashion, in the wider project team.

The design schools within which we work and have carried out this project are themselves very different, historically, institutionally, in orientation to the professions and research, in languages, cultural diversity and funding models.

What we do have in common are dedicated staff and highly motivated students, and these are local and national, and increasingly international. So too are the staff in our establishments who are themselves design nomads in a sense that they shift domains and interest, courses and collaborators, projects and teams, tools and assessors. And they too are representative of places and cultures, experience and expertise that is filled with difference as much as it is commonality. This has been apparent in the many events we have held during the project that have been far more the richer for participation and a diversity of perspectives beyond our own institutional, national, disciplinary and cultural borders and arenas.

An open access outcome

The books are open access. In PDF format, they're free of charge. No subscription fees. Please share them under the Creative Commons licence. You can download and read the PDF on a screen in ways you select and prefer.

A public resource for re-purposing

You can refer to the material as you choose in your own learning, teaching and research. And in the spirit of Creative Commons, please give credit to what you use. The books are composed to be read in a variety of different ways, depending on interests, need and time. Search, cross, select a chapter or subsection that interests you. Read a longer item or read sections more as modules.

We hope that the volumes work this way and that they are resources to which to return and perhaps reframe your own thoughts and replace ones we might have suggested. Do let us know your thoughts and the paths the material in the books and the companion website has suggested you follow or influenced you to make.

Do please forward the documents to anyone you think might find it useful.

Working with various modes and shifting scales

Like other design students, teachers and researchers this work has taken place largely within the formal boundaries of the global pandemic. We attempted to shift our work and to support our students' learning through the project, indirectly and directly.

This was through specific Master's classes and PhD summer schools, in providing online resources parallel and affiliated with courses project material. This took place in on-site and online workshops and in special sessions tailored for specific courses, and in the projects many public online.
Two of the project partners more directly ran full and challenging courses and were able to pursue detailed and connected pedagogical trajectories (see for example student videos in I03) and others supervised PhDs directly and indirectly connected to the project. We've included collaborative writing with several of the doctoral students and included material and reflections that have informed and challenged our thinking.

Moving forward

We've been a transdisciplinary team and we are still learning how to learn, design, teach and research design futures literacies in our own workplaces. Do feel free to contact us to hear more about the project and perhaps to discuss your own work with shaping design futures literacies in your own design educational contexts, framing and practices.

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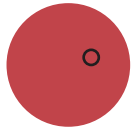# DESIGN
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CREATIVE, CRITICAL, RECURSIVE, ANTICIPATORY

BY Andrew Morrison & Karianne Rygh

Introduction

Futuring as a design problematique

All design education, to some extent, engages in working with the as-yet-to-be built, realised and experienced, in not just one but many possible futures that lie beyond the here-and-now and our design histories and influences of their legacies. Shaping futures through design has been central to novelty and innovation in modernist design, as well as in the professionalisation of design and growth in design universities. Further, shaping futures has increasingly been informed by design research and the interplay of research-based pedagogies and teaching- and learning-based research. Yet, many of the ways design has approached novelty, trends, innovation and futures are now not only questionable but also challenging. This is so due to the rise in undeniable and catastrophic results of human policies and practices and their consequences at both planetary and local levels.

The force of presumptive economic models and unbridled growth logics and systems, in which design has been complicit, entails related environmental and societal effects and tensions concerning climate change, species extinction and survival, food and water security, materials use and changing drivers of consumerism, to mention a few (e.g. Micklethwaite & Knifton, 2017; Latour, 2018). These are deeply challenging contexts in which 21st century design education is embroiled. Nocek (2022) argues that design is at the root of these crises, leading to futures needing to be perceived and acted upon as a 'design problematique' (e.g. Reeves et al., 2016). In our view, futures ought to be approached in terms of interdependence and understood through a dynamic design learning poetics that links the human and non-human, environmental and systemic, imaginary and locative, cultural and communicative (Bozalek, et al., 2021). In doing so, we see a need and benefit from a relational transdisciplinary approach to designing as process and developmental in character as well as being about form and disciplinary formality.

To follow this approach of dynamic design poetics of relating, it is helpful to have read the introduction as well as the closing chapter to Volume 1 of *Design Futures Literacies* as it will assist in positioning the extended essays which make up Volume 2, *Essays and Reflections*. Volume 1 of *Design Futures Literacies*, introduces readers to the dynamic, emergent and generative ethos and action-based nature of the FUEL4DESIGN project; the project's ventures into design futures literacies were presented through four different

parts: 'situating', 'elaborating', 'reflecting' and 'anticipating'. The Volume was composed in this way to convey the changing, challenging and characterful nature of the dynamics between futures and design and from a design and design education view.

Further, by creating links between the different parts of Volume 1 as well as making connections to and between the essays in Volume 2, we attempt to enact a relational approach to elaborating and reflecting upon both project outcomes and the experience of participating in such an international, collaborative research project. The elaborations and discussions within the compiled essays therefore present both transdisciplinary views and potentials, as well as potential pitfalls of developing design futures pedagogies.

This second volume also aims to open out spaces for possible alternatives and redirected design education further into the 21st century in terms of intersections and transversal between design, social innovation, transformative learning and sustainable systems change (e.g. Yee et al., 2019). This ranges, for example, from working with digital literacies (e.g. Jones, R. & Hafner, 2021) and specifically design processes, products and services (Trompe & Hekkert, 2018), to specifically pandemic inflected design embodied approaches and spatial manifestations (e.g. Gueorguiev & Anagnost, 2022).

Furthermore, it spans 'engaging with notions and sense of grief and loss in negotiating transitions to post-carbon futures (Lindström et al., 2021) in affective moves concerning deep and long-lasting societal transformation to which design education already contributes and will continue to need to do so.

That this expanded take on design education is not only needed but needs to be actively taken up, is evident in how design adjusts to the consequences and changes in its metamorphic approaches 'after lockdown' of the global pandemic (Latour, 2021). This also concerns response to the rapid and already extensive reach of machine learning and the arrival of tools such as Chat GPT and their effects on human-machinic AI-centred views and practices around agency, identity, and design in futures literacies. The relations between designers' creativity and A.I.-infused, technically enacted designing, will change labour practices and leisure experiences. They are already propelling urgent discussion on *Design Futures Literacies* as human agency becomes even more porous and challenged by 'machine learning, environmentally and technically.

Key matters

With the subtitle *Essays and Reflections*, in Volume 2 of *Design Futures Literacies* we build on and deconstruct material conveyed in Volume 1. We do so in terms of the novel work carried through in the FUEL4DESIGN project and in the related reflection on its contributions to a reframing and repositioning of design learning in terms of complex and emerging contexts and crises and as regards futures in design education. In doing so, we also acknowledge the changing scope and dynamics of global aspects of knowledge recognition and generation as design schools and the design profession work out how to reconfigure their values and activities. This concerns meeting more

global design needs and local specifics for different and plural engagement, and active constituencies for meaningful environmental and societal impact that are directed towards long-term responsible survival.

What are we to make of rapid developments in design education both at a European level and globally, such as through the FUEL4DESIGN project we refer to here?

In the context of rapid, ongoing and unexpected change, related challenges and needed responses ranging from climate to politics, economics and social change, how might we improve and strengthen our curricula to prepare and motivate our students for 21st century challenges?

What might these entail when we approach them in an anticipatory frame?

What are design's legacies for working with the emergent and the unknown?

To what extent do they support, or limit ways design educators may work to support student learning for long-term, sustainable futures of work and the planet within which it will be located?

Are our notions and practices of futures suited to these tasks or may they need tailoring or rethinking, adaptation, mitigation or replacement?

What might design futures literacies and related pedagogies be and become and how might we approach them as design problematics in their own right?

Matters of ethics, time, regulation and care for the longer term are in serious need of further engagement by design educators and students who are already deeply involved in design change processes, such as working with 'green technologies' and long-term strategic design. However, without commitment to facing the ecological, political and economic means and ends to which technical design competencies are put, we will not be able to position design futures literacies to support the transformative dynamic of learning.

For Mouffe (2022), successful alliances between the ecologically regenerative and the democratically transformative must include attention to affective concerns and engagement. This she argues is all-the-more crucial to pursue and secure when the world is faced with surges towards political authoritarianism. Increasingly visible, and occurring in the context of climate change, emergencies and economic and political migration, design and its futures need to address large, systemic and challenging issues that cannot be separated from narrow and broader conceptualisations and practices of design literacies.

Moves towards continuing environmentally denuding and destructive policies and practices directly threaten the potential and needed contributions of design to anticipatory futures learning. They do so within design schools and within our professions, and reach into the dynamics of relations and partnerships with others for realising designs changing roles in 21st societies and systems (see also Muratovski, 2022). In our shared view, this is much a matter of meta-design (see Essay 8: Tools, Means and Mediating Design Futures Education).

Design education by definition has to continue to make our design futures. These issues are not merely matters of incremental innovation or belief in technical solutions, but contribute to our potential different, long-term sustainable futures. Here, the importance of STEM-related design work and investment in start-ups needs closer attention. Alongside these, is the importance of conceptual, speculative work and its direct but also indirect and abductive roles in transposing the immediate, the projected and the prospective via design (e.g. Rosner, 2018) back into actual hard negotiative and facilitative work in our daily classrooms, studios, field work and collaborations [Figure 1].

Towards anticipatory design education

Multiple framings

In engaging with the as-yet-to-be built, through understanding interdependencies and when developing a design poetics of relating, it becomes increasingly relevant to critically re-examine existing models and approaches to working with uncertainty, and at times, apparently chaotic contexts.

As creatures of habit, we attempt to recognise patterns and structures when faced with complex challenges and rely on developed methods and approaches to make sense of that which is unfamiliar, uncertain or what may appear to be impossible. Design students and educators have much to process in working with design in transition, as in the foundational work of Irwin (2018) and colleagues, and design in changing notions and practices of futuring (e.g. Poli, 2014; Urry, 2016; Reeves, et al., 2016; O'Brien & Forbes, 2021), and in relation to digitalisation, tools, futures and learning (Poli, 2019; Ross, 2023).

Here some key acronyms are themselves dense markers of just how complex is our understanding of change and how it is implicated in systems and formations and actions of power, agency and participation. In the 1980s the VUCA explanatory framework was developed to go beyond the traditional day-to-day management and leadership approaches and make sense of constant and unpredictable change through focusing on volatility, uncertainty, complexity and ambiguity. After almost 40 years, the BANI framework has been proposed to replace VUCA in adapting to our current times. While VUCA takes into account and describes the state of the world, BANI (Batterman Consulting, 2023) - brittle, anxious, non-linear and incomprehensible - offers support, understanding and more specific classification of complex challenges. Further RAAT (Cascio, J. 2020) – resilience against brittleness – is a formulated response to BANI supporting us to take action, by focusing on attentiveness – being present both physically and mentally ready to act, adaptation against non-linearity – promoting flexibility and the ability we have to take a hold of the future, transparency against incomprehensibility – increasing transparency for better understanding, making it possible to raise critical questions and find meaning in the system.

If a system or organisation is rigid and does not have room for flexible adaptation, it can continue to seem stable on the outside but become porous and 'brittle' on the inside, prone to unexpected collapse if overloaded. In following this train of thought, key to the development of new approaches, models and frameworks, is focus on working anticipatorially and prospectively towards recognising emergent topics and contexts prone to becoming brittle through situated, multimodal, intersectional and transductive means. Doing so raises issues on the development of Design Futures Literacies.

These issues are related to crises in which design cannot but see itself as part of the complex and compound compression of values and policies together with the compacted pressures and consequences of their accumulated and repeated enactment. Design education - in the span project's three-year life - has been exposed to its own structural and systemic underpinnings while reaching for creative solutions to immediate and emerging and changing needs. Numerous design schools engage in their own ways and, indeed, differently, in facing these issues. In these two volumes, our offerings are modest despite their effort and a sense of urgency. There is by no means one future or a design futures pedagogy that can be mapped and contained or seized or saturated. The future remains elusive as ever and available for exploration.

At the same time, as one of the guest speakers at our closing project event, Ramia Mazé, reminded us, design futures too may be colonised and directed by specific power configurations and even assumed practices may limit the very access to processes and resources for change (see also Mazé, 2021). In dialogue with such colleagues and international guests, and in different institutional and disciplinary settings, our diverse project team has sought to engage with futures in an open, relational sense. We tried to remain open to options and possibilities while facilitating the fabrication and materialisation of informed and ethical futures through designing. In doing so, we have motivated pedagogies of curiosity with critique (e.g. Glăveanu, 2020). We have instiled in our students that taking up design futures literacies and applying them responsibly back into changing presents may demand creative leaps and transgressive

EXPECTATIONS-FICTION

Define this word and imagine how it plays a role in designing futures.

↻ **GENERATE A NEW WORD**

Future Education and Literacy for Designers (ERASMUS +)   Go to the Design Futures Lexicon

◄ **Figure 2**
A data-generated
term from the
CHIMERA tool
in the DESIGN
FUTURES LEXICON,
(Image credit:
AHO).

instiled in our students that taking up design futures literacies and applying them responsibly back into changing presents may demand creative leaps and transgressive acts beyond current expectations and assumed positions [Figure 2].

Exploring the as-yet-to be pedagogically

Clearly, futures and design have arrived at the forefront of demands on our curricula, literacies, pedagogies and practices. In the contexts of crisis, challenge and ongoing uncertainty, design education continues to be under massive pressure to reconfigure itself. This involves moving away from economies of unsustainable material use that has been based on exponential extraction and 'growth' and to instead develop regenerative ones that, at root, emblazon values of equity and respect for human and non-human relations. These are relations that must be geared towards long-term survival as opposed to short-term profit, and thereby challenge us and our students to engage in some of the most difficult changes faced globally.

However, these changes ought to be addressed in the structures, mechanism, curricula, networking and anticipatory relations we build, shape and share through experimental and strategic activities of redesigning design education [Figure 3]. For us, this is all about anticipatory design pedagogies. These need to be generated, trialled, revised and redesigned in iterative, and recursive participatory processes of learning, combined with exchanging expertise, knowledge and experiences in dynamic processes of becoming. This is in keeping with related methods and work in design and ethnography and design anthropological futures (Smith et al., 2016; Pandian, 2019) and where care, ethics and futures are connected (e.g. Adam & Groves, 2011).

As a small, but quite closely aligned group of designers, design educators and design researchers from four different design universities across Europe, we shared interest in working with relations between design and futures. This led us into engaging with aspects of futures such as foresight and scenarios in Futures Studies and from design concerning relations between design fiction and speculation. This included interest in imaginaries and engagement, encompassing narrative, interaction, media, philosophy and trend analysis.

In working with Futures Studies, we quickly encountered legacies of bounded linear planning, prescriptive strategic decision-making and dominant systems perspectives that seemed at odds with more emergent and contemporary approaches to social change and environmental transformation in which design pedagogies and research are already involved. Adam (2021: 123), writing on time and futures, reminds us that 'To take the future seriously, therefore, requires that we engage with our implicitly held assumptions about the nature of the future and its reality status. We also need to address how we conceptualise this invisible, intangible domain of the Not Yet.'

As part of such a pursuit, Facer and Sriprakash (2021) see approaches to futures literacy as being constrained by focus on technical expertise, such as in the futures literacy work of UNESCO and Miller, such as in Transforming the Future: Anticipation in the 21st Century (Miller, 2018). In contrast, they propose meeting matters of plurality, power and transformation (Facer & Sriprakash, 2021: 8) in 'learning future's by way of a 'provincialisation of futures literacies". Akin to this diversity of approaches, from the situated to the temporal, historicity and active presents - the essays in this volume draw on a wider relational knowledge framing, making and exchange. However, we see that we in some ways begin our ventures where this characterisation of futures literacies by Facer and Sriprakash begin.

Prior to FUEL4DESIGN, in our various contexts of research, projects and teaching, we had already delved into design's typically modernist-infused avant-garde and utopian prospective framings of what-is yet-to-be. We had encountered the restrictions of colonialist thinking and related normative enactments in western dominated views on design. On more than a few occasions, we were also confronted with forces and limits of techno-determinist promotions of cultures and practices, growth and change. In the dynamic of the FUEL4DESIGN project, with futures in design as our design pedagogical material, we have worked pragmatically and relationally in recursive, not only reflexive

acts beyond current expectations and assumed positions ones that, at root, emblazon values of equity and respect for human and non-human relations. These are relations that must be geared towards long-term survival as opposed to short-term profit, and thereby challenge us and our students to engage in some of the most difficult changes faced globally.

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As a small, but quite closely aligned group of designers, design educators and design researchers from four different design universities across Europe, we shared interest in working with relations between design and futures. This led us into engaging with aspects of futures such as foresight and scenarios in Futures Studies and from

design to relations between design fiction and speculation. This included interest in imaginaries and engagement encompassing n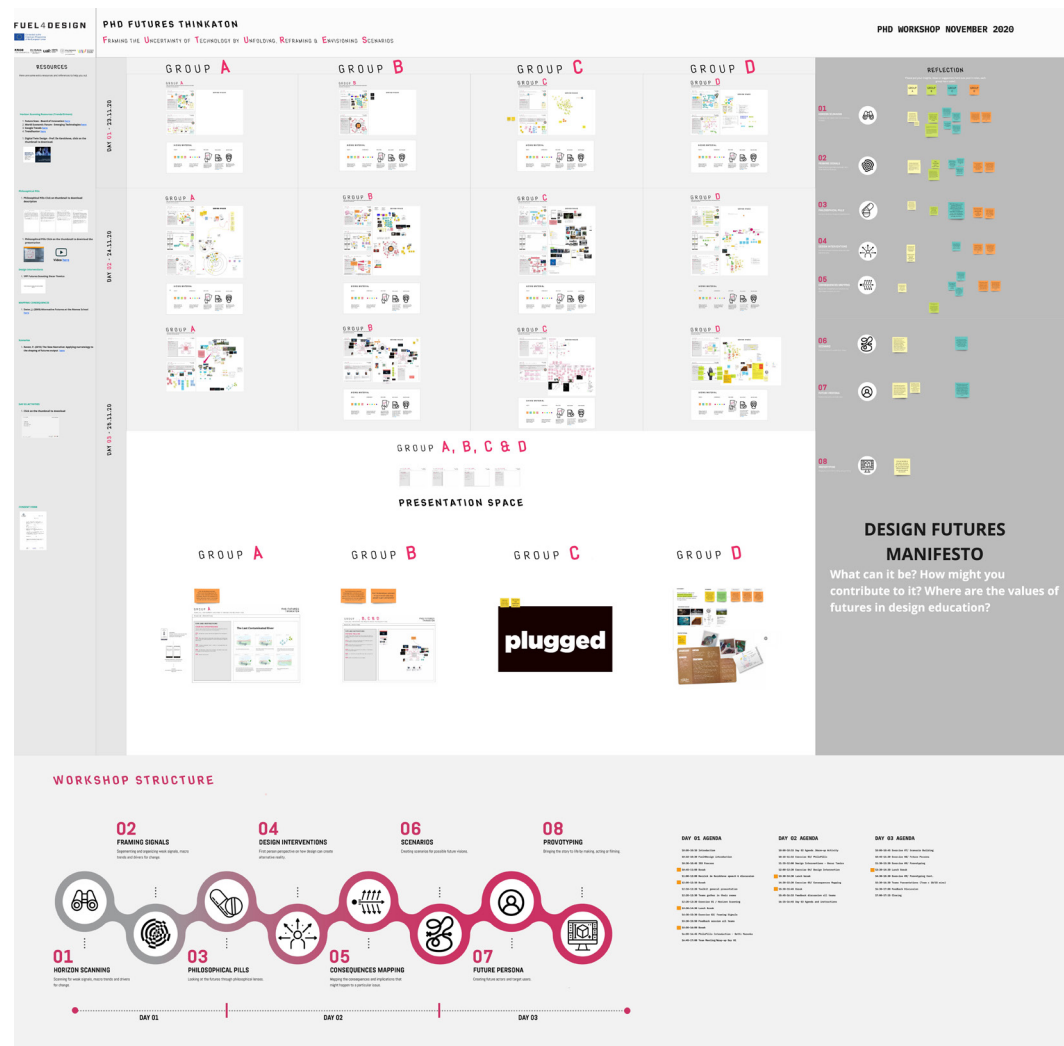arrative, interaction, media, philosophy and trend analysis. In working with Futures Studies, we quickly encountered legacies of bounded linear planning, prescriptive strategic decision-making and dominant systems perspectives that seemed at odds with more emergent and contemporary approaches to social change and environmental transformation in which design pedagogies and research are already involved. Adam (2021: 123), writing on time and futures, reminds us that 'To take the future seriously, therefore, requires that we engage with our implicitly held assumptions about the nature of the future and its reality status. We also need to address how we conceptualise this invisible, intangible domain of the Not Yet.'

As part of such a pursuit, Facer and Sriprakash (2021) see approaches to futures literacy as being constrained by focus on technical expertise, such as in the futures literacy work of UNESCO and Miller, such as in Transforming the Future: Anticipation in the 21st century (Miller, 2018). In contrast, they propose meeting matters of plurality, power and transformation (Facer & Sriprakash, 2021: 8) in 'learning future's by way of a 'provincialisation of futures literacies". Akin to this diversity of approaches, from the situated to the temporal, historicity and active presents - the essays in this volume draw on a wider relational knowledge framing, making and exchange. However, we see that we in some ways begin our ventures where this characterisation of futures literacies by Facer and Sriprakash begin.

Prior to FUEL4DESIGN, in our various contexts of research, projects and teaching, we had already delved into design's typically modernist-infused avant-garde and utopian futurist framings of what-is yet-to-be. We had encountered the restrictions of colonialist thinking and related normative enactments in western dominated views on design. On more than a few occasions, we were also confronted with forces and limits of techno-determinist promotions of cultures and practices, growth and change. In the dynamic of the FUEL4DESIGN project, with futures in design as our design pedagogical material, we have worked pragmatically and relationally in recursive, not only reflexive acts of making and reflection accentuating the 'local', but also in wider re-framings and changing practices of futures and design beyond earlier approaches to foresight and functionalist design [Figure 5]. We presented this work back to one of the emerging interfacing challenges, crisis and change in design, futures, learning and research in the form of a curated session at the online, globally attended *4th International Conference on Anticipation* (Morrison et al. 2022).

Learning in uncertain times

As if these few aspects were already not daunting enough for design educators, the COVID-19 Global Pandemic arrived within the first six months of the project, radically upending its early life and then its entire trajectories. The pandemic challenged and changed ways we were able to teach and learn, communicate and research, work in partnerships with professionals, meet and exchange ideas and experiences (Rodgers et al., 2020a; Rodgers et al., 2020b). Design education shifted from being a shared, if differently realised and resourced, pursuit within our contexts as elsewhere in design schools across the globe to becoming the core simultaneous focus for all design universities.

A reflexive exploration to imagine how terms for futures design can relate to the plural COVID-19 crisis, from a design-driven perspective.

Thoughts and ideas can be related to ongoing initiatives or speculate on possible future actions. Explore further by generating a new combination. **(HIDE THE RULES)**

HOW
DOES...

+

IMAGINARY

• Describing what exists in the mind alone.

• Based on surmise or abstraction, not reality or facts.

• A quality of creative design or story making.

• An invented, fanciful or illusory construction.

+

LIMIT

+

(IN)
DESIGNING FOR
**REMOTE
WORKING**
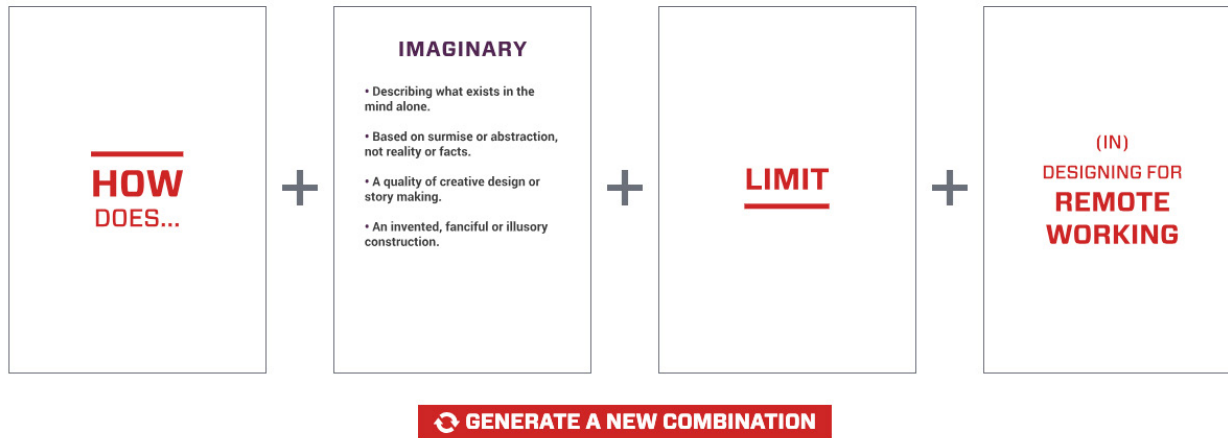
◄ **Figure 5**
A reflexive exploration to think how DESIGN FUTURES LEXICON terms relate to the COVID-19 crisis.

`⟳ GENERATE A NEW COMBINATION`

I need some help: `SEE THE VIDEO TUTORIAL`   I'm done with the REFLEXICON: `I SHARE MY FEEDBACK!`

Equally, design teachers needed to respond to the separation of materials and modes of communicating in screen spaces, workshops from teaching and learning activities propelled into online spaces and interactions. Zoom and Miro, amongst others, rapidly became two of the most widely uttered words and arenas in our daily work. Scheduling, sequencing and time management took on new digital qualities as students and teachers alike engaged in adjustments to well-tried practices and to developing flexibility with new modes of teaching and learning. Sensitivity to the needs of individual students and to group dynamics in predominantly studio and face-to-face oriented pedagogies, were brutally supplanted by issues of access, fluency with digital tools and interactions and new.

Working within our own diverse pedagogical practices, we found a need to be more explicit about these matters and discuss our educational experiences, not only in-the-making but importantly, our learning legacies as these impact on changing presents and emergent futures. As taken up in Essay 1: Anticipatory Design Literacies, the project worked with an expanded view of literacies (e.g. Host & Gladwin, 2022; Kuijer & Robbins, 2022). This entailed literacies as situated processes and performances, from skills and competencies to multimodal mixed material fluencies as processes and repertoires that continue to be elaborated in the activities of design learning and teaching.

Design education and design futures were suddenly and challengingly a joint, global yet locally variegated experience. Matters that earlier had seemed to pertain to rather more distant futures seemed to have been suddenly - and demandingly - jettisoned into the present. Mid-semester, design students found themselves removed from contexts of studios and shared on-site learning to being asked to transition to online platforms and tools in a largely unrehearsed pedagogy of design distance education.

By adding futures to the mix, together with the systemically and performatively complex change in contexts and conditions brought about by the pandemic, we found ourselves immersed and entailed in deep cognitive developmental activities and emergent challenges. This extended, for example, to rethinking and re-working perspectives on language and literacies in an anticipatory design situating the frame, as well as a critical reviewing of how we approach tools, methodologies and methods in less normative, device-exploratory manners with students' first person learning perspectives as shown at the start of the chapter.

As a whole, as Manuela Celi and Chiara Colombi from PoliMi venture towards the close of Essay 8: Tools, Means and Mediating Design Futures Education, this is essentially about a reconfiguring of 'metadesign' in, as and through the exploration and shaping of design futures literacies. In the midst of these reconfigurations and realignments, much about our given ways of conducting design education was exposed, personally and institutionally.

This included the energies and exchanges of students working in labs and studios and to the processes of fieldwork and the dynamics of collaboration (e.g. Maxwell lane & Tegtmeyer, 2020) and not only learning through doing but doing so in project-specific and wider communities of practice.

On a relational anticipatory design pedagogy

Such a relational anticipatory design perspective does offer design educational institutions and pedagogies a powerful, philosophically and practice-centred stance together with a need to support and develop performative agilities and critical articulations in terms of related design futures literacies. In our view, taken together, this may be understood as a form of anticipatory meta-design knowing. This is knowing as process and as change, and it is knowing materialised through exchange and openness to a mode of way-finding, not the repetition of a blueprint or adherence to a linear trajectory based on principles of short-term extraction and profit at any cost.

Such anticipatory design is plurally transversal. It recognises difference, variety and diversity as resources not hindrances while also acknowledging the plurality of futures and diversity of the future (Magnus et al., 2021). It seeks to engage our socio-technical imaginaries as materials in the contextual and temporal realisation of hopeful, actual futures. This centres on learning as transformation, which needs to be brought into being by designers, design educators and design researchers together with master's and doctoral students in design schools that are fit for an unfolding 21st century.

These are sites of deep change and imaginative, creative production composition and reflection. Here critique, reflexive assessment and evaluation will need to continue to contribute to design universities and lead them to become venues for further critique of exactly how this may be done. We argue that it is through the very design and design-enacted materialisations of relational design pedagogies and futures design literacies, that an anticipatory design ethos and pragmatics may contribute to long-term societal and environmental transformation that is ethically, creatively and pragmatically sustainable.

Working with crisis and design futures pedagogies

This has been made patent for us all, and in a systems design view, when working with design futures literacies in the contexts of the climate emergency as well as in the service design and public health challenges in the global pandemic. Design for emergency, migration and designing in contexts of extreme weather, such as heatwaves and urban redesign have been forcefully manifested across the globe. Such crises demand design schools engage critically and creatively in meeting systemic challenges and the need for changing approaches to fossil fuelled political economies. The devastating effects of extreme and extended heat on human bodies and lives, as well as the environment (drought, ice melting, sea level rises) mean that closer intersections between 'design' domains and urbanism and landscape need to be pursued and anticipated. Innovation and pragmatic applications are no longer matters for securing market advantage and seamless service delivery, but need to take experiential design of services and long-term systemic change making into deep temporal futures. That the CO_2 being released into the atmosphere remains there means we need to re-engage with temporality as a design material.

Our colleagues and readers who have experienced these pandemic-with-futures adaptations and work-arounds are more than familiar with the demands placed on design pedagogies under the pandemic, as well as the ways it has impacted our own institutional and local settings and practices. With a focus on not only literacies centred on being aware of futures, future readiness and foresight tools for 'future-proofing', through FUEL4DESIGN we have in addition taken up further issues by way of invitations and interventions within what rapidly became a 'pandemic design pedagogy'; see Giroux (2021) on matters of 'pandemic pedagogy'.

As we drew this book together, and such a design pedagogy under duress began to abate as the pandemic weakened and daily life shifted to a 'new normal', our anticipatory design futures were complicated even further with the Russian invasion of Ukraine. Human-made geopolitical contests destroyed and continue to take human lives and effect, amongst other consequences, global supply chains and increases in cost of living. Seeing how again how our students need to understand and situate the relations of their functional, creative, technical and contextual design futures literacies to wider societal, systemic and environmental settings and processes, yet another twist occurred in the form of machine learning and A.I. literacies. Human-induced climate change meets a shift from learning about and design for 'big data', interaction design and relations to digital culture and futures. The shift this time, however, is that software and related 'intelligent' systems, such as CHAT GPT, work not only generatively but adaptively as they respond and alter their articulations to our inquiries. Yet that is not all. They also contain, to some degree, capacities to reflexively shape their own meta-structuring abilities independent of human intentionality. Such generative A.I. uses natural language processing to respond to our drives for dialogical communication while scaffolding its own computational modelling of neural networking. This digitally mediated communicative generativity is not only language-centred but is already multimodal in its materialisation in visual forms such as via the tool Dall-E.

Our understanding of change and challenge, engagement and articulation in terms of design futures literacies took a sharp, serious turn towards rethinking our teaching in interaction design and technical, strategic and communicative relationality. Attention to design and post-humanism, centred much on living things and biological systems, and has now extended to rethinking 'deep learning. This move' needs urgent attention to matters of ethics, regulation and policy. For design educators it places attention to futures in design right at the centre of shaping our design futures literacies. It does so in ways that we had not all anticipated would occur so rapidly or gain such attention due to the performative capacities of these new computational tools and their own generative systemic literacies and their human emulation.

In a contribution to the new journal Possibility Studies Facer (2023), we are reminded just how important it is that we attend to temporality as we engage in a diversity of anticipatory practices (see Essay 4: Time, Design and Anticipatory Learning). Time is neither natural nor neutral, Facer argues (2023: 61). Attention to our temporal imagination, always situated and culturally framed and articulated, needs closer consideration, she suggests. This is so that we can engage carefully and productively in a provincial or non-modernist approach to working with plurality and futuring where possibilities themselves need to be deconstructed in their own communicative contexts of making and shaping. Here, Facer motivates for attention to rhythmic coordination, temporal narratives and temporal plurality and offers a comprehensive set of questions for our further consideration. The essays in this second volume may also be seen to address such questions and attempt a design future literacies take on the similar agendas raised by Glăveanu (2022) in the foundational issue of *Possibility Studies & Society*.

Extended essays

Making design futures multiplicities matter

As a whole, the eight essays that comprise this second volume of *Design Futures Literacies: Essays and Reflections,* form a set of intertwined perspectives on anticipatory relations between design and futures in graduate level design education. The rhizomatic relations and discourses presented offer ventures into situated means to shaping possible analytical, methodological, pragmatic, imaginary and analytical approaches to ongoing and apposite developments between, across and beyond learning, research and professional transformations. Together, this shapes approaches to futures in designing. The essays may therefore be read according to patterns and combinations of interest and need; they have been written to be read relationally with regard to the FUEL4DESIGN individual work packages presented in Part II of Volume 1 and a wide body of research inside and outside of design inquiry and practice. As a bundle, the essays attempt to build a relational design futures educational discourse with illustrative and indicative examples drawn only from the project. We encourage readers to look through the presented speculative, pragmatic and situated links to online respourcesm events and examples in order to rework and rethink these [Figures 6 & 7]. This can be done through making connections and distinctions to one's own practices, teaching, learning and research. As (Avanessian (2017: 190) argues, 'Speculative poetics implies generating experience that provokes change.'

Anticipatory Design Literacies

Essay 1: Anticipatory Design Literacies situates a relational view on exploratory, experimental process oriented and heuristic learning about shaping intersections and distinction between design and futures. Anticipatory Design refers to design that seeks to develop design literacies, practices and analyses that 'take care ahead of time'. In doing so, we extend approaches of futures literacies as preparation for futures to situated and emergent design futures literacies that are realised via speculative-pragmatic activities returned to creative-critical presents as much as prospective imaginaries.

Further, we take up a mode of 'using the future in education' (Facer, 2016) and extend it to making design futures in learning through anticipatory designing. The essay draws on the breadth and specifics of the project to argue for specifically design infused and exercised futuring, oriented towards the entanglements of the demand and needs of the present along with emerging, unscripted and hopeful alternatives to current constraints and restrictive policies and practices. The essay addresses matters of relational design (e.g. Blauvelt, 2012) and its applications in shaping futures oriented design. It seeks to contribute to an ontologically plural discussion and anticipatory

reframing of design pedagogies to actively and imaginatively rethink 'design in crisis (Nocek & Fry, 2021). We argue that in placing futures in design education, 'We are also embedded in realising design for futures learning where futures are part of materials and mediated relations between human and non-human, environment and experience, histories and the emergent.'

Altering Prospective Design Pedagogies

In Essay 2: Altering Prospective Design Pedagogies, we take up some of the key challenges design education in a futures view faces. These are ones we inherit and presume as much as the ones we strive to alter and improve in our ongoing practices of supporting anticipatory student learning. Planned project work was forcefully upended by the arrival of the global pandemic and required we made a major digital pivot to entirely online learning resource mediation, processes and pedagogies, together with our scheduled face-to-face and multi-venue events. We claim that 'In all of this, such changes and adaptations may be understood as an action mode of "reassembling the literacy event" as its being and including attention to human and non-human actors (Lenters, 2015).'

In further learning in flux, as the project and the pandemic played out, we were confronted with many core, systemic and institutional features, practices and challenges embedded within design schools and practices. In this essay we discuss these in terms of a processes of unlearning and positionality in postnormal times, drawing on, for example, blog posts and reflections from project events, the website's strategic communication outputs and examples of working to facilitate facilitation and by way of retrospective dialogues between project educators.

The essay continues with reflections around a set of three interlinked tensions: 1) Immediacy-Durability, 2) Organisational Contexts - Civic Agendas, and 3) Experimentation-Articulation. Through these tensions we discuss and motivate for wider transformations of design education through incorporating sensitive, situated pedagogies that are infused with hope and serious play. These are pedagogies that reach beyond assumptions and presumptions and offer some means and examples to develop prospective thinking directed back into thick presents and transformative actions. Overall, 'With futures as a key concern, the project would need to also look sceptically at the lure of the future, to disambiguate false prophecies of the new, of techno-determinism and marketisation of creative economies and generation of neoliberal higher education systems.'

Sustainability, Systems and Learning Design Futures

Working to support design education in a futures view, raises matters around long-term sustainability (e.g. Ceschin & Gaziulusoy, 2020; Chave, 2021). Further it demands that we engage with issues and directions to do with systems design. How by design are we to foster, foment and facilitate the development and growth of sustainable systemically vibrant presents for future flourishing? In Essay 3: Sustainability, Systems and Learning Design Futures, we go into these matters in a positioning survey of design and sustainability and Systems Oriented Design (S.O.D.). These are discussed with regard

to claims for a circular economy (e.g. Beckert & Bronk, 2018; Korhonen et al., 2018) and approaches to degrowth as design engages critically with its own complicity in underpinning logics of exhaustion. This relates to complicity in contributing to the very extractivist, linear and consumption-driven logics, at the cost of environment, biodiversity and planetary survival in the face of climate change and species extinction. This entails reflection on both design and futures as 'progressive' in their march for the new and to replace rather than repair and renew. It allows us to argue for design education that is geared towards and enriched by deeper analysis and understanding of sustainable design practices and alliances together with attention to systemic, underlying and transformative change processes and potential.

As with other essays, examples are drawn from projects by master's students and extensive doctoral fieldwork. In these endeavours we have attempted to connect design sustainable imaginaries, systems and change and to situate them in subjunctive and substantive settings and enactment. Here in terms of S.O.D., we argue for a designerly, cultural framing of both approaches to anticipatory systems from a futures angle together with systemic tools and practices, highlighted amongst others. We motivate for a design education in which deep systemic matters are situated in terms of long-term and durable sustainability. Here we motivate for furthering bonds and explorations between emergent anticipatory design cultures and sustainability-systems dynamics with a focus on the need for added attention to matters of political economy and design futures learning (e.g. Wizinsky, 2022). We conclude that '… in this current period with acute need for systemic responses and fundamental changes to dependencies on fossil fuels and unbridled modes of consumerism, design education institutions ought to be more fully galvanising their collective powers of imagination, commerce, communication and criticality to offer visible and actionable alternatives.'

Time, Design and Anticipatory Learning

Next, in Essay 4: Time, Design and Anticipatory Learning our attention turns to a core feature of working with relations between design and futures, namely the temporal. While time has been taken up in various aspects of pedagogy and research in design and in futures, seldom are these explicitly connected, nor positioned, in regard to design concerning wider related expertise in the humanities and social sciences. We see that design futures literacies are fundamentally temporal. However, we argue that '… futures iniquities and design and a futures shaping activity, in essence need to be more fully discussed as chronotopic literacies.

These are literacies that address matters of socially emergent configurations and working of relations between space and time'. To underpin and release such claims to support creative-critical active learning, we outline some of the key writings on temporality, spanning narrative, social sciences and most recently the Anthropocene, that geo-epoch of human-inflected consequences beyond our further direct manipulation. In the context of a planet that is temporally threatened and where design and futures are increasingly potentially entwined in shaping alternate, different and potentially better ones, rethinking and transformative action is needed via acts of design and, crucially, design learning.

Design and research are infused with time and yet the temporal is one of the aspects of designing that perhaps receives less direct attention than other modes. In this essay, we look to time as a design material; we live in time, we design in time and we design uses and engagement for others in the times of their experiences and engagement. We place special weight on temporality and scenarios and ways in which they may be more fully realised in an anticipatory aspect. While futures are always immutable, slippery and shadowy, we need to continue to learn how to know and form designerly engagement with it by knowing our pasts so as to inform our 'future presents'.

As plural, poly-cultural perspectives recognise diversity in decolonising design and temporality, so too do we need to prime and prompt our students to work with the entanglements and richness of time as a cultural and performative design resource. Posthumanist views, along with the 'deep time' of the Anthropocene, challenge western and human-centred chronotopic notions and practices. Equally, our curricula are in need of making space for time that is not committed or directed, and for reconfiguring processes that are in the throes of unfolding and emerging. This is illustrated with an example from PhD fieldwork in the chapter. Where this indicates how knowing in time and in place may unfold, we need to notes how time may be deployed to constrain and curtail anticipatory stances and potentials for anticipatory design education.

Care, Engagement and Design Futures Knowing

Relations between healthcare systems, well-being and the design or related services has grown enormously in the past decade, especially in emergence of Service Design. Earlier location of services in management and marketing has shifted to customer and participant centric experiential services provision. This has been substantial in the domain of Public Healthcare and magnified and problematised massively in the context of the COVID-19 global pandemic. All design schools, students and teachers have been deeply embedded in emerging design futures in the present of public policies and social practices around health and care. In Essay 5: Care, Engagement and Design Futures Knowing we follow through on work underway and reposition it in the wider context of Service Design that needs fuller, ethical and pragmatic principles practices in what we see as 'an anticipatory ethics of future care by design'. Drawing on feminist and non-representational theories of care, this chapter is co-written by a doctoral student and key researcher in the project to offer experiences in looking beyond short-term solutions and to more systemic, situated 'care-full' futures that make for more discerning, just, and humane presents.

This chapter takes up conceptual and pragmatic approaches to connecting work on ethics of care with a view of 'care as design, design as care' so as to work towards developing anticipatory service design for well-being. In case terms, focus is on the exploratory and situated design of tangible tools and services in early-phase, situated development for shared decision-making on resource allocation for a new oncology ward at a Norwegian hospital, as a step towards establishing a new cancer centre. The chapter further discusses how 'service ecosystem design (Vink, et al., 2021) might be interpreted in the contexts of design futures pedagogies in terms of a wider project into connected care, in summary, we argue for a shift in working with design futures literacies from capabilities to design pluralities of connected care.

Agency, Enactment and Design Futures Literacies

Following this focus on care, in Essay 6: Agency, Enactment and Design Futures Literacies we consider the crucial place of agency in the enactment of design learning and teaching, especially where relations between design and futures are in focus. In design studio pedagogy, considerable attention is given to students' individual and collaborative processes of making and reflecting.

While devoting attention to materials, contexts and participants as part of students' studio and practice-centred learning, in many settings design educators find themselves under increased pressures in terms of resources and increased student numbers. Our curricula are also challenged by the ever-expanding ambits of design and related transdisciplinary and situated means and processes of enactment. Facilitating students' own agentive learning is central to much design education.

However, this needs special support in the context of uncertain and indeterminate contexts and changing conditions, and, further still, at times swirling expectations, such as during the pandemic. In this chapter, we take up the notion of design-based learning ecologies and place agency and learning pathways within a broadly transformational approach to learning and knowing. Concerning design futures, action, agency and autonomy, we write that 'A mix of media, narrative, fact and affect occur in these activities and their dynamic and relational co-construction of identity, interests and knowledge building'.

Drawing on relational views on sociocultural learning theory, a diverse framework that design education too seldom takes up to its pedagogical and analytical advantage, we heed the claim by Stetsenko (2017: 197) that 'we-come-to-be-as-we-change-the-world'. Following details on related writings and studies - as a mode of input from the learning sciences to design and futures, and as a buttress to work in the two volumes that highlights emergent literacies of design and futures - we tend to issues of rehearsing learning futures through designing and learning design through futuring.

We do so with examples from master's and doctoral projects and accentuate the importance of creative and critical readiness in shaping futures by design and shaping design via futuring with the overall goal of supporting transformative long-term resilience, such as shown in a blog post on an online workshop 'Hacking Futures – Futures Hacking' by our UAL partner.

In conclusion, we suggest further attention be given to ways design and education, learning and learners, may be better positioned to take on challenges and secure futures for those who come after them and for futures that remain to be shaped and lived. Here, designing anticipatory learning requires ingenuity, criticality and engaged action in order to offer more than current horizons. Remaining open and yet curious about remote horizons beyond immediate knowing, can only be approximated in design learning as engaged processes of becoming.

Learning Design by Making Futures

Next follow two essays concerned with the 'hows' of making and knowing. In Essay 7: Learning Design by Making Futures, we cover a variety of ways of approaching design learning though making activities and reflections about methodologies and methods. Drawing on earlier essays here we present such making as needing to acknowledge designs histories and legacies as well as emerging and future scripting practices in development. In working with design and anticipation, it is necessary and unavoidable to address matters of making, materiality and power, where decolonising design includes attention to reassessing and critiquing methodologies while encouraging innovation, ingenuity and criticality as regards creativity.

The essay features work and writing by four PhD students, including co-writing with supervisors and individual inputs to the project, including focus on materials and posthuman perspective on learning through making. 'Their work in this essay covers relations of making design futures through designing and analysis, methodologically and in terms of methods. This refers to research methodologies and methods and to design tools and techniques.' Also included are reflections on the Design futures Toolkit and ways it drew on the Futures Philosophical Pills in supporting students in learning that their actions matter and have consequences. Here we argue that it is the key that students appreciate that alternate open futures are needed and that in working with them they 'develop their own compass' (as mentioned in I05 Unit 00). Key in this is building community, testing tools, positioning oneself and developing transdisciplinary practices. Overall, we present such methodologically and philosophically located in modes of becoming, illustrated for example in experiments on First Person Perspectives by ELISAVA in the I03 DESIGN FUTURES SCOUTING as a mode of priming learning how to learn, such as in developing awareness and acumen in gendered positionality. This also extends to modes of research through design (RtD) and the development and exercise of 'design anticipatory methodologies and methods' (un/designing; 'alterplinarity'; re- and counter-framings).

In 'Making futures design literacies material' a central focus has been fostering creativity and brainstorming, such as in illustration for the PhD Futures Thinkaton: 'Designing in Transitional Times'. The essay also addresses working with compositional methodologies (after Lury, 2021) in developing the interplay and dynamics of futures tools and processes in order to be able to pedagogically '… position the knowledge framings of how we realise and study our endeavours.' In terms of design research, we need to frame the selection and interplay of methods and tools through which our investigations and ventures are structured and understood. This may be seen as a matter of 'design composition'. We feature doctoral research that shifts 'From 3d form to digital diagramming, to situated scenario development'. This leads into a focus on scenarios and speculation in futures world-building with illustration for learning resources developed and related PhD student work for the course 'Design in Times of Crisis'. These have transformed the affordances of the Futures Wheel tool into the student mediated outputs of a collaborative online project. Many scenarios may also need to be developed in such processes, including speculative variations in a mode of design fiction in which human-non-human ecologies are in play.

Tools and methods thus need to be connected to environments and imaginaries, and to the challenges of climate change and shifting needs when working to realise relations between design spaces and interventions. Here, as in other essays, a joint reflection by a team of design teachers contributes to the overall focus on ways towards adaptably 'realising actions, activities and hopes'. Further, we address matters of design critical catalysts in action through mention of foundational and more recent takes on 'critical design'.

These are all also linked to reflection across to Essay 2 on tensions in institutional and systemic senses while also paying attention to embodied and multimodal making-knowing relations. In closing we note that, '… we will need to continue to critique our own emerging narratives and practices, methodologically and pedagogically, if design futures literacies are to be anticipatory and actionable and to deliver actual options and alternatives that will motivate and engage our students in shaping shared survivable futures'.

Tools, Means and Mediating Design Futures Education

Essay 8: Tools, Means and Mediating Design Futures Education takes up relations between means of making and communicating and their implication in an anticipatory design educatory view. We note at the outset that critical views on our design legacies as creative design generative imaginaries, converge in our immediate present. These are influenced by 'how it is that we learn, live and work in the unfolding contemporary dynamics of the now' to which we return with experience from activities and experiences of future shaping.

We comment that 'To do so we are entangled, indirectly and directly, in processes and activities that are materialised through meta-design and recursive, abductive and transversal re-design and analysis. Not only do we find ourselves "differently arrived" and re-positioned in a slightly out of focus poly-present of sorts. This is also a present that is uncertain, in flux and on the move.'

In this essay, we take up a number of ways of facing and exploring these dynamics. First is focusing on design tools, toolkits and a need to tackle assumptions about tools as sets of solutions waiting to be activated rather than structuring and infrastucturing devices and drivers that too need deconstruction and re-design for specific work in anticipatory pedagogies. As with other essays, we cover considerable related research as without this depth many of the underlying issues and potential may be obscured methodologically and pragmatically.

This is extended to a section on the uses of metaphor in design underpinned by an in-depth literature review, to more fully underpin the various applications of metaphor across the project, including our own teacherly experimental practices and descriptions together with students' workshop sessions. Discussion included 'metaphors we anticipate by' and 'metaphors we learn by', drawing on the foundational Metaphors We Live By (Lakoff & Johnson, 1980).

Similarly, there follows a section on play, cards and design futures literacies. As cards are widely used in futures work, this section aims to reposition such approaches through illustrations and discussion on different features and 'cases' from three of the work packages in the project.

Across this chapter attention is given to ways mediational aspects of anticipatory design literacies and pedagogies matter and are the matter of experimental, open and exploratory learning together. This is presented, for example, through a detailed case study of a master's student project by a team of teachers from ELISAVA and by way of brief extension of work on the Design Futures Lexicon on its futures.

The chapter closes with an overarching and important contribution on Meta-Design, 'the project of the project' as it were, to assist us in seeing relations in depth and reach, as well as offering 'means to situating and connecting perspectives and practices and indeed potentials of tools, means and mediation in shaping design futures literacies.' Reflections are given on work inside the project's Design futures Toolkit and extension to work in Mexico in which Meta-design has provided key inputs and outcomes on shaping our anticipatory presents ahead of time.

Further, anticipatory matters and means

New horizons, different problematics

Despite gaps in what might have been covered and achieved in the project, collaboration has been central to the realisation of these essays. Joint writing and in a number of forms, as well as individual reflections together contribute to the eight different chapters. While these may feel like stand-alone pieces at times, we suggest reading them in conjunction with the chapters in Volume 1 on Design Education Reconsidered and Learning Futures Design Otherwise.

As a whole the essays also elaborate on tensions in design education that tend to be addressed in rather diverse and partly disconnected fora. As mentioned in Volume 1, our own design organisations and conferences provide key venues for the pursuit of shared needs, interests, new horizons and transformations in further future-design relations in design education.

We have also followed the requirement by our finders for open access and creative commons publishing. This is against the emerging and increasingly confrontationally problematic monopolies on design (and other educational and research) publication by a few dominant publishers, to whom we do still refer as content is contained in their accumulated sites of knowledge publication.

In design educationally driven transformational terms, we encourage readers to read these essays as counter-acts and extensions to the wider design politics of knowledge within which design education is implicated. We suggest this through relational chartings and recursive reflections into ventures into reclaiming design education and the roles of students in shaping these transformations [Figure 8].

Figure 8 displays a dynamic network visualisation with numerous nodes and connecting paths. Labels include:

Tech for equality, Users as designers, Making UBI work, Future of Jobs, Fighting AI Bias, Human-machine creative collaborations, Co-design with AI, Metamaterial / metadevice design interface, Adaptive social and technical infrastructures for new forms of collaborative design, Metadesign, Living algae, CO2 capture by living diatoms, Organic waste capture from water by algae, Embodied design, Longtermism, Interspecies Solidarity, Leveraging biological technologies, Acoustic wave capture, Metamaterials, Carbon neutral lifestyles, Co2 Capture devices, Anthropocene, Living algae CO2 and pollutant capture device, Feedback loops in design, Fighting anthropocentric conflicts, Reclaiming mass, energy and agency from the technosphere, Renewable waste Electromagnetic wave capture, Sensor design, Dismantling filter bubbles, Split ring resonators, Climate Consciousness, Manipulation, Surveillance capitalism, Attention protection, Narratives about technology and agency, Redesigning social media, The truth wars, Circular data economy, Collecting data from the environment

Legend
- ● Interventions
- ● Intervention path

◄ **Figure 8**
Dynamic visualisation by student Saira Raza depicting her chosen weak signals (in grey), associated keywords that describe her project's intervention during the year (in purple), and other possible keywords for research and intervention opportunities (in blue). Master's in Design for Emergent Futures (ELISAVA, IAAC). DESIGN FUTURES SCOUTING. (Image credit: ELISAVA & IAAC).

To do so also implies we need to exercise our own pedagogical and research design futures literacies as much as we champion and open out to them for our students. As de Bruyn and Lütticken (2020:1 6) mention in their own work, so too with Design Futures Literacies, 'This polyphonic book is a conversation that, despite all odds, is a little utopian moment.'

In our view, design education, somewhat ironically, is one of our specialisations that, despite the speculative and utopian that arrives with futuring, has not been fully captured, pragmatically speaking, by the behemoths of accredited design publication and marketing. Open format books and papers now appear far more frequently yet they too are in processes of being designed as modes of ensuring excellence, securing transparent processes and demarcating impact.

The essays we present here are financed via project funds we secured through competition, though the fundamentals of that programme are for distributive, shared futures in learning. We hope that these essays therefore also provide means to gather, garner and synthesise a large body of resources for continuing to rethink and to inquire into ways to carry education and research through futures in design.

Hopeful futures, dynamic pedagogies

In the context of the United States and the cultural devastation of First Nations' lands, livelihoods, populations and cultures, Lear (2006) draws on the experience and insights of a leader of the Crow People, Plenty Coups (Alaxchiiahush). In doing so, he proposes that a collective aspirational stance is needed to think differently about how to survive the systematic destruction of a culture among many under the march of supposed western progress. Positioning radical hope as an alternative to the 'abysmal reasoning' that led to and leads to such demise of already flourishing human life and relation to the land and its resources, is also applicable to our current, compounded and interlinked global and local crises.

In FUEL4DESIGN we needed to invite such a position, as mentioned in the closing chapter to Volume 1, to motivate students and colleagues and ourselves to look beyond contemporary phenomena and the acute, volatile and emerging needs and difficulties of everyday experience. We have encouraged students, our event participants and one another to hold hope open and to look carefully, playfully and critically towards differently framed and realised design futures and futures in design learning and in education more widely where design might have a more present, active and transformative role.

We would hope, further still, that these essays will provide some of the longer form means to presenting and motivating these views and related discussions. We invite readers to venture with us as we all continue to engage, and together as a sector of higher education and as a profession, in anticipatory relational design learning.
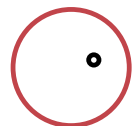
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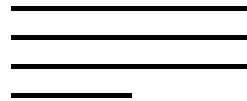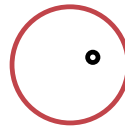
ELABOR
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ANTICIPATORY DESIGN LITERACIES

BY Andrew Morrison, Manuela Celi, Betti Marenko & Oscar Tomico

WITH Palak Dudani, Bastien Kerspern & Amanda Steggell

1. ORIENTATIONS

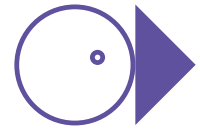BY Andrew Morrison & Manuela Celi

Making frames

In this thematic essay we mark out some of the main concerns that a futures-oriented design education might include within a framing we label 'Anticipatory Design' (Celi & Morrison, 2017). In essence, Anticipatory Design refers to design that seeks to develop design literacies, practices and analyses that 'take care ahead of time' (Morrison, 2019). Through FUEL4DESIGN we have taken up the term and made it more visible to highlight relationships, potentials and pedagogies that contribute to a dynamics of shaping futures and design (Candy & Potter, 2019). In adopting a view of design futures literacies in-the-making, our framing is not meant to be universal, absolute or determinist. Rather, it is dynamic, relational and emergent in character and it is situated in a diversity of contexts and acknowledging difference and plurality. In brief, our work adopts a mode of 'using the future in education' (Facer, 2016) and extends it to *making design futures in learning through anticipatory designing*.

In our view, anticipatory design futures literacies and pedagogies are plural and stretch beyond a 'futures literacy' approach (e.g. Miller, 2018) that centres on supporting learners and citizens, businesses and organisations, policy-makers and governments to be more aware of the future and ways to incorporate this in their work and lives (see e.g. Gray, 2018). An anticipatory design futures literacies and pedagogies perspective and related activities acknowledge that the future is plural, provisional, slippery, polymorphous and indistinct (Escobar, 2018; Augé, 2014). Anticipatory pedagogies are ones that engage participants in adaptive and prospective designerly making. They look ahead of current constraints to options, alternatives and possible scenarios for change that can be redirected back into action in the present. This may be achieved through relational and transversal thinking for transdisciplinary long-term sustainable knowledge building and sharing. This demands the exploratory, principled and reflexive exercise of criticality while shaping mediated techno-cultural design tools, artifacts, processes, uses and engagement.

In short, this demands we engage as educators and design students with ways in which power and processes are manifested within existing configurations of the selection, promotion and preference of views and methods. It extends to how these are taken up actively and in modes of transformative anticipatory learning that engages with the 21st century 'critical turns' in education (Gottesman, 2016). These are turns that encompass a diversity of voice and views – feminist, decolonial, posthuman – in ontological dispositions and re-positionings of learning as a matter of 'becoming' and

◄ **Figure 1**
Example of embedding design speculative products within a futures scenario discourse, from The Open Journal of Refuturing 2131 (Design BRICS, rendering by Jomy Joseph, AHO, 2021). (Joseph, 2021: 92). **Link ↗**.

'otherwising'

[→ SEE **Vol.1 - Part III. Learning Futures Design Otherwise**]. This accentuates attention to gestures and influences (not directives and resemblances) in processes of emerging knowing that are arrived at through the interplay of situation and subject, context and process, body and affect, motion and making.

In our view, Anticipatory Design, in contrast to Foresight and Foresight in Futures Studies (e.g. Poli, 2019), embodies a relational ontological orientation that's realised via a speculative-pragmatic perspective. This allows us to engage with contemporary societal and environmental issues and needs around inclusion and equity of human and non-human systems, agency and life by focusing on difference, diversity, decolonisation, depatriarchisation and 'otherwising'. To do so also need experimental thinking and exploratory action in a reconceptualisation of learning spaces and outcomes in what may be considered contact zones. Where such a metaphor and spaces of prosessual, asymmetrical power relations in linguistic and cultural knowing have been widely taken up, (e.g. through the work of Pratt, 1991), and linked with border crossing and boundary objects in design, education and technology studies (Morrison, 2009: Morrison, 2010; Bowker, et al., 2016); we also reference to the recent transdisciplinary publication *CONTACT ZONES* (Latour & Weibel, 2020).

We do this in an exploratory, and hopefully not exclusionary, mode of learning together through working with emerging futures practices in the present. Barrineau et al. (2022) conceive of such a venture and stance as a mode of radical futurity in which an emergentist approach to education is adopted and explored - centred on core notions of disciplines, emotions and sustainability - so that young people are able to arrive at and pursue motivated directions of their own informed choice. Further, in a product and rhetorical view, as Jomy Joseph, one of the PhDs liked with FUEL4DESIGN at AHO, comments in his practice-and compilation based thesis, '... in telling a compelling narrative of radically different futures, an encounter with a conflicting artefact may lead to a creative speculation of its own.' (Joseph, 2023); [SEE **Figure 1**]. In this sense, our work has sought to engage with that other design educators and researchers have explored in

terms of *Rehearsing the Future* (Hasle, et al., 2010), which in our case has involved acts of 'scripting' to improvising in the context of futures in the plural and in which futures and futuring are taken up as design material and acts of designing to learn and to know. Long-term champion of anticipation, Poli (2019: 139-140) writes that:

> *Learning to look ahead – developing future skills – is perhaps the best choice if we want to try to divert the experiment in which we are all involved from the likely catastrophic outcome to which it seems directed. But to be able to look ahead, it is essential to be able to stand upright, with your back straight and your eyes open, willing to do what needs to be done.*

The overall aim in offering this orientation to *Anticipatory Design Literacies* is to bring the ontological to the foreground (Willis, 2006, 2014, 2016). We adopt this focus not to confirm positions and views, to reinstate design complicity with an extractivist capitalist logics that so clearly confounds actual change, whether it be on climate and environment or equitable public services and ethical design practices very often driven by corporate rather than human and ecological needs and symbiosis. Instead, pedagogically, and for shaping design futures literacies - by design and through design learning - and for futures design, this orientation is developed through and as situated practices (see e.g. Micklethwaite & Knifton, 2017). Smith (2020) provides a useful related approach in *How to Future*, though this is not design education directed work.

As a whole, these are critical practices that inform designing-learning and researching and shifts between them as knowledge 'exchanges'. Such exchanges are a mix of the creative, critical, contextual, participative, communicative, prospective and the provocative. Design future literacies, therefore, are centred on transformational learning, student and educator agency, and contextual and ethical enactment and engagement.

Questions and concerns

Given such trans-relational and intersecting aspects of anticipatory design and pedagogies, we now present a number of core questions in this essay. These were central to establishing the FUEL4DESIGN project and are regrouped and revised here with a focus on ontological aspects:

> **What does anticipatory designing mean in the context of facilitating and enacting design oriented futures literacies?**
>
> **What are design framed futures perspectives and why do they matter for our design pedagogies?**
>
> **What work can relational, processual and situational views do in shaping design futures literacies beyond given assumptions and practices?**
>
> **Why attend to the imaginative and creative in working with futures to inform and alter the present?**
>
> **What's the point of a situated anticipatory designing in facilitating long-term sustainable futures?**

Relational and recursive-re-visionings

Below, we elaborate on these matters and turn them reflexively and recursively back onto the related outline of futures design presented in the Introduction in Part I, and in Part II that includes the six main 'work package' areas of the FUEL4DESIGN project. We do so to distinguish between futures design practices and futures design inquiries.

Our motivation is to go deeper into their connections in FUEL4DESIGN's experimentation with futures-oriented pedagogies and to look to related projects and endeavours. We elaborate on how futures have come to be seen as plural and how in terms of design futures and learning this needs to be understood in terms of diverse, different and intersectional plural futures framings.
In these framings, design needs to be more fully situated and framed in relation to re-thinking and re-appointing sustainability-systems relations [→ SEE **Essay 3: Sustainability, Systems & Learning Design Futures**], matters of temporality and design futures literacies [→ SEE **Essay 4: Time, Design & Anticipatory Learning**], care and an extended field view of ethics [→ SEE **Essay 5: Care, Engagement & Design Futures Knowing**] and a dynamics agency and enactment [→ SEE **Essay 6: Agency, Enactment & Design Future Literacies**] and to its being actively exercised in the present for engaged and impactful long-term sustainability.

Opening up to and demarcating aspects of Anticipatory Designing and Designing Anticipation in design futures learning and pedagogies asks that design, looks to its own discourses and practices, concepts and world views, educationally, professionally and in terms research. It needs to do so in the contexts not only of climate change and global instability around food and water security, amongst others but also in negotiating the status and motivations of perspective and preferences, in a time of 'fake news' and directed marketeering, and to pay attention to what Rommetveit (2022a) elaborates on in a 'post-truth' framing in *Post-Truth Imaginations: New starting points for critique of politics and technoscience* (Rommetveit, 2022b).

Opening up, creatively and critically, to Anticipatory Designing and Designing Anticipation also asks that we include orientations and ontologies, emergent in design-located futures inquiry and processes of making, together with ones prevalent in other domains of the humanities, social sciences and technology studies and developments in related and intertwined fields of practice, production and use.

This view aligns in large part with 'the challenge to how designers engage with the planetary crisis we are living through' in the collection *Design in Crisis: New worlds, philosophies and practices* (Fry & Nocek, 2021a: 1). In a framing of design in crisis, Nocek and Fry (2021: 4) write that:

> *If life itself is under siege (and in ways that we elaborate below), then it is largely due to the modern political ontology that design has brought into being. This is a crisis by design. Still, the challenge, which has so far not been met with an adequate response, is to see how this planetary crisis puts design itself in crisis: human and non-human ontologies cannot be reimagined without rethinking the very being of design. In short, design is immanent to crisis.*

In this first of eight essays, and in these books as a whole, we offer a set of inter-related array of endeavours to work with problematics in design futures literacies and design futures pedagogies. We try to hold onto the view that the determination of a problem is not its solution (Deleuze, 1994; Marenko & Brassett, 2015) remembering as Marenko (2018: 38) argues that design inquiry needs to be rebooted through a shift from problem solving to problem-finding.

To this end, in this chapter we work towards opening out, not boxing in, some of what may be seen as core content matters and potential directions that learning by designing futures and being open to a mode of 'futurescaping design learning'. We position and elaborate on what this may offer to working towards an anticipatory relational design futures learning frame in 21st century settings.

2. RELATIONALITY AND AN ANTICIPATORY DESIGN EDUCATION

BY Andrew Morrison

Redirecting design futures education when design is in crisis

Earlier, we outlined the contradiction of the modernist, teleological ad techno-determinist Design typical of the 20th century that searches for the novel, for invention and innovation, for progress and betterment of human existence to the cost of ecological, environmental and planetary survival. Fry (2009) has argued that design needs to be reconfigured and to operate differently through what he calls a 'futuring redirective practice'. This refers to the need for concerted action to change practices and policies, pedagogies too, that reinforce the approaches and behaviours that contribute to the crisis of climate, of existential threats, disquieting experience, confusing ideas and unrevised strategies. Below we argue that such futures redirection cannot be realised nor our planetary survival - approximated if not ensured - if design education does not work with futures ontologies and epistemologies in active programmes and networks that recognise human-non-human relations, ecologically, technically and 'cosmologically'.

Needed in situating design futures literacies and pedagogies is a rethinking and repositioning of what Nocek & Fry, 2021: 12, original italics) frame as 'the relation between crisis and the ontology of the *problematic*'. This is central to disentangling and re-aligning ways Design and designers have typically responded to pressing and emerging issues and in its pragmatic responses and approaches to innovation that have all too often been driven by a design-as-solution ontology and practice. While good intentions and genuine commitments to working for good permeate wide swathes of Design, action-driven pragmatic solutionism, in assertions such as 'Design can fix it' and 'We can design out way out of this', all to often mask and misdirect what is fundamentally at issue and in need of closer elaboration.

Nocek and Fry (2021: 11) argue that in order for design to avoid the standard response to provide a solution to a 'problem' - where design solves, stitches up and rationalises a further presumptuous heroics – is that 'design might respond to this crisis as a problematic'. In addressing this problematic, they refer to Continental philosophy, central to our own positioning of design futures literacies in relation to world views and ontological dynamics in design learning. In particular they refer (Nocek & Fry, 2021: 11) to that 'Deleuze upends how we tend to think about the relation between problems and solutions: the problem is never exhausted by the solutions it makes possible (Deleuze,

On Relational Design Ontologies

Anticipation 2019 is a unique, radically interdisciplinary forum for exploring how ideas of the future inform action in the present. It brings together researchers, policy

A relational ontologies perspective is one of event-as-process, where 'becoming together' (Deleuze, 1987) and not just 'being together' acknowledges and works with the emergent relationality of relations as they come into play through pedagogical events and interventions. Our perspective and approach 'is a question of arraying oneself in an open space, of holding space, of maintaining the possibility of springing up at any point…' (Deleuze, 1987, p. 353).

We share with Kearnes (2006) the view that 'Design is always in a process of ontogenesis because it is in a complex relationship to a world that is itself complex and in motion: design contributes to such dynamism at the same time as being affected by this world of becoming' (paraphrased by Brassett, 2015, p. 32). In this the 'ontological incompleteness of design' is signalled (Kearnes, 2006, p. 20). Design scholars Fry and Willis have expanded the concept of 'ontological design' and the importance, from a sustainability perspective, of how 'design designs'.

Barad's term 'agential realism' further articulates such agentic action as intelligibility understood to be 'an ontological performance of the world in its ongoing articulation' where 'knowing is not a bounded or closed practice but an ongoing performance of the world' (2007, p. 149). In this view, design for sustainability is about matters concerning not only the sustainability of the designed object itself but also the design of the relations located in current and future contexts (Fry, 2009).
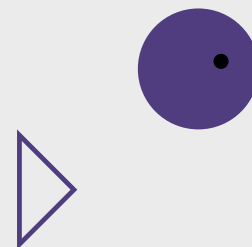
1994: 165).' They argue that what is needed is that we view problems as '… indicative of a certain ontological distribution of tensions, pressures, and strains that give rise to a wide array of responses/solutions.' (Nocek & Fry, 2021: 11).

In looking to appreciate and include difference and heterogeneity in reframing design futures literacies and pedagogies in a relational view, and when design is in crisis and design education subsumed in a global pandemic, it has not always been straightforward to demarcate, hold onto and enact a clear stance on design education as a problematic while the external world and the internal venues and activities of teaching and learning have themselves been uncertain and where our responses have been challenged by misfits between assumed practices and emerging challenges. In these contexts, student and teacher have been working within a crisis when design has been in crisis. These two intersecting and concurrent pressures, however, have also undeniably placed the futures design education and the roles of future sin design education into sharper relief, magnifying them but also distancing them and dissipating ways they can be addressed through a focus on 'solutioneering'. Nocek and Fry (2021: 13, original italics) argue that 'Design is *in* crisis, and we need to think through this crisis by holding together the multiplicity of frames through which crisis becomes visible without reducing, negating, and otherwise subsuming any of them under a single frame of reference.'

Through its own processes of needing to relates to the deep challenges of Design in crisis and crises within which Design finds itself, the FUEL4DESIGN project has needed to constantly negotiate a variety of affiliated frames - within, between and across - own specific educational settings together with the qualities and status of its own formulations and responses. Our colleagues have argued that we need to 'Walk the talk: Toward an ecological futures framework for our designed cultures' (Edeholt et al., 2021). What has become increasingly apparent is that Design while we need to hold together a multiplicity of frames, working with design futures literacies cannot be pursued in a meaningful and transformative sense without looking to the power dynamics and valencies within which such literacies have themselves been positioned in and through design. This aligns with the assertions made by Fry and Nocek (2021b: 219) that in order to avoid the dehumanising and defuturing effects of what has been, 'design has to overcome its own conditions of crisis' by way of intentional acts of defuturing (Fry, 2020) that remake design as a futuring redirective practice and position design accordingly.

> *… the implication of embracing the process of remaking design as futuring redirective practice (Fry, 2009), directed by autonomous designers (Escobar, 2017), is that an ontologically recursive dynamic … means designing and remaking design becomes a continuous conscious process. (Fry & Nocek, 2021b: 219).*

What we have done is not just argue for this but investigate its immanence within collaborative anticipatory experimentation into and through design futures literacies. This is in essence an ontological venture while being at the same time an exercise into and the exercise of *an anticipatory and pedagogical mode of learning-research*

through design. By this we mean that such an ontologically recursive dynamic is also realised through its placement and enactment in the interplay between growing knowledge - as student design futures literacies and teachers design futures pedagogies – and these are materialised and experience, as well as applied and assessed, reposition and revised in the intersections and interplays between learning and teaching, analysing and researching. In this sense our emergent literacies and pedagogies are not merely formative and developmental in their genesis; they offer experimental anticipatory illustrations that are ontologically generative and methodologically transductive, not merely conductive, in their reframing of a 21st century design futures education [→ SEE **Essay 7: Learning Design by Making Futures** and **Essay 8: Tools, Means and Mediating Design Futures**].

This may be understood in terms of what our colleagues Håkan Edeholt and Jomy Joseph at AHO have called call 'ReFuturing'. In contrast to Fry's defuturing, 'ReFuturing, therefore, is an invitation to imagine the seemingly impossible and realise the unthinkable - from whole systems change to climate reparations to the dehumanisation of everyday life'. (Joseph, 2023: 150). The notion and stance have been born out of product design courses and related network oriented research centred around the '... reclamation of design and designing to prepare it for these new systemic responsibilities and look at the conditions that may be needed for this to happen'. (Joseph, 2023: 139). In a sense this is to think and act hopefully beyond crisis, doom and catastrophe discourses (e.g. Danowski & Viveiros de Castro, 2016).

In terms of design learning and teaching and related research, FUEL4DESIGN has variously worked with dynamic, heterogeneous, poly-logical perspectives. In framing our ventures and inquiries broadly in a relational anticipatory design perspective, we have also needed to deconstruct and look to decolonising our own perspectives, structural and systemic practices and to hold onto - to hold ourselves firmly to and to hold forth our position tentatively – to explore relations between the what is, what if, what might be and what can be [→ SEE **Vol.1 - Part III. Learning Futures Design Otherwise**]. To that end, we also needed to situate how relational design sits within design and how we have heuristically selectively taken it up also as an ontological design futures material in rethinking design futures literacies and pedagogies.

On relational design

Through the dynamics of our work in the FUEL4DESIGN project and in research related to it and to other projects, a relational perspective on design has been central. Philosophically, a relational ontology views relations between subjects and objects as mutual rather than separate. This has been central to the process perspective in our FUTURES PHILOSOPHICAL PILLS and to a range of different contributions in support of design students' futures-oriented learning. We see a relational design perspective as offering design educators and students with framings and positionings of ways to work with the complexities and unfolding nature of designing in a changing world. It offers us all, to whatever degree or extent or commitment depending on our own subjective views and disciplinary leanings, principled means to working flexibly and adaptively while remaining creative and critical. This is no mean feat to claim and to sustain. This

book hopefully provides some evidence of how this might be done variously, and it suggests ways to do so differently. We see this as a fundamentally important position to propose and to try to hold open and to hold onto as approaches to futures are changing and being changed as climate, economic and geopolitical forces wreak havoc on civic order and societal and environmental needs and matters of planetary longevity.

Relational Design, as it has been named, has some of its motivations in relational aesthetics where lively debate has occurred concerning art, institutions and the everyday. However, Relational Design has not featured greatly in design research and design educational discourses. In a series of e-books, Holloway (2012a, 2012b, 2012c) outlines core conceptual aspects, issues on practising relational design and dialogues with practitioners and educators. As Suchman (2005: 3) reminds us, this too concerns the 'relational character of our capacities for action, the constructed nature of subjects and objects, resemblances and differences; and the corporeal grounds of knowing and action'.

One central voice on Relational Design has been that of Blauvelt (2012: 44) who states 'Relational design is preoccupied not just with design's form or meaning, but with its effects; not with isolated objects, but rather with situations embedded in everyday life.' Blauvelt outlines five themes in relational design: the birth of the user, the democratisation of the designer, the contextual turn, the power of the many, and the rise of the social. For Blauvelt (2012: 48):

> *Relational design does not name a style, a school, or a movement. Instead, it is an analytical tool by which we can better understand the historical evolution of ideas in design. It privileges process over product, open platforms and systems over one-off objects, and design understood as situated experience. If the old modernist maxim was 'form equals content,' its contemporary is 'form equals context.' While most 20th-century design is autonomous, independent, isolated, and closed, relational design is synonymous with interdependence, connectedness, and openness. It evokes today's network culture, both literally and metaphorically, and the web of associations, uses, and contexts determining design today.*

In our design pedagogies and daily social and professional lives we meet protocols and platforms, practices and preferences that constantly remind us that our world is structured and infused with choices and implications located in how power is inscribed and enacted.

Our relational design is realised in and as activities, that is as designing. Drawing on notions of situatedness and learning, relational design pedagogies are not only abstracted away from their socio-material practices and manifestations. Rather they are realised in experiments and articulations with materials, processes and participation. Taylor (2020) sees design as a key creative practice that is both open to the real and to social connections and that it thereby works as an 'interface with the everyday life and situations' beyond narrow functionalism. Taylor (2020: 189) writes that in working with design as relational '... it is necessary to conceptualise each new

condition to which design is applied as being entangled in a wider system of systems that, in being dynamic and emergent, will always have a unique structure of interrelation and consequence that includes the experiencing subject.' In the context of object and emotive design and a relational view on design, Taylor, (2020: 202) concludes that:

> *By refusing to accept that the borders of what we do are fixed by the sterility of what serves the market and an approach to the material that sees endless consumption as efficient whilst denying the power and importance of our emotional lives, it may then be that we find new purpose. In these moving objects, these things that wear their performativity on their surface, that shout and play, that scream that there are other ways of doing things, it may be that we find not just a way to survive but a new way to live.*

In our view, what is at stake today for design futures literacies is the negotiation in our pedagogical and research performative practices of what such a new way to live might be and its design futures aspirational character and dynamics. This extends to what our design futures need to be in the context of urgent needs for change and ethical futures making, whether transitionally, prospectively or critically troubling our present preferences and expectations.

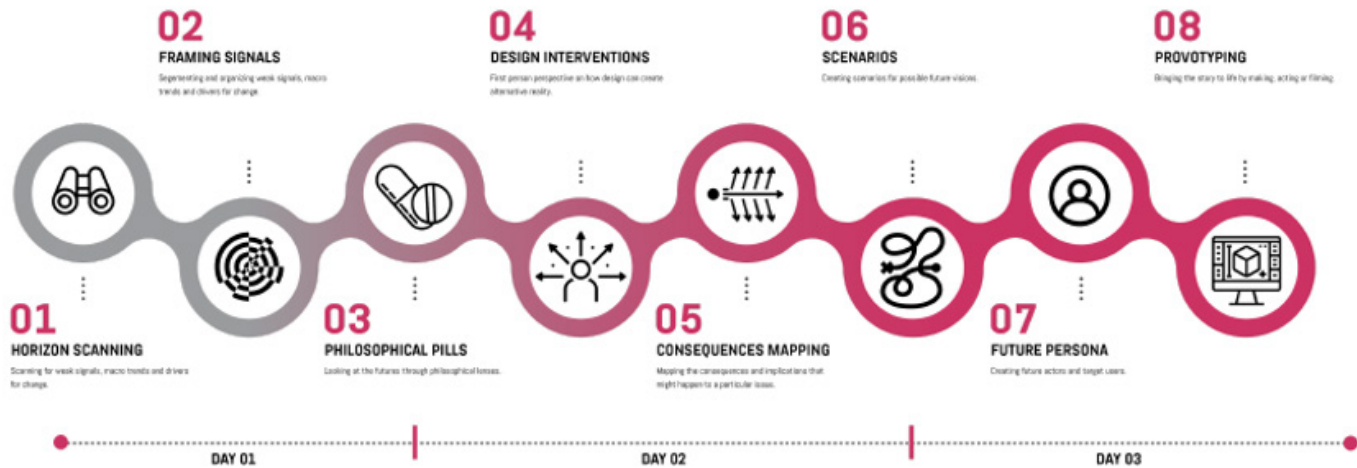## Relational pedagogy and relational literacies

Where relational design may not be very prominent in design studies and pedagogy, neither are relational literacies and relational pedagogy nor in sociocultural and pragmatist traditions in education. Relational pedagogy was used by Baxter Magolda (1996) to refer to a mode of connected teaching that included respecting the student as knower and links to their own experience and peer-based learning. Drawing on this work in the context of epistemological beliefs of teacher education students, Brownlee (2004: 2) characterised a relational mode of knowing as 'open, flexible, connected and responsive'; this is synonymous with much of the approach adopted and explored in FUEL4DESIGN, and in our view significant for working with futures in design learning. Baxter (2004: 4) writes that:

> *Relational pedagogy and connected teaching both imply that tertiary teaching should be a relational activity: that is, connections between self and theory (epistemological beliefs) and interpersonal relationships. Therefore, to help student develop more sophisticated (and relational) epistemological beliefs that connect self and theory, it is important to consider how teacher education programs may be improved using pedagogy, which is also, relational in nature.*

Biesta (2004) discusses relationality by focusing on the gap between participants, students and teachers, to a learning activity in which it the interaction in this zone that is paramount. Such interaction is negotiative and engages in making meaning in situated contexts, where processes and clarity need to understand messiness, emotions and emergence. Related then is the notion of anticipation as taking care ahead of time, as well care as working to support nurturing on the part of educators and students in shaping educational and future flourishing relationally (e.g. Thayer-

Bacon, 1997) as all education is also reaching into potential and preferred futures [→ SEE **Essay 5: Care and Agency in Design Futuring**]. Across and within elements of our project, we developed learning resources on futures in design education for master and doctoral students and their educators, but also with students and teachers, and that it is this, together with a focus on exploratory and shared 'learning events', that was a key part of the relational design based pedagogies we offer. This can be seen in the orientation chapter on our **FUTURES PHILOSOPHICAL PILLS** and in the parallel text in these pages [→ SEE **FEATURE 2**].

WORKSHOP STRUCTURE

02 FRAMING SIGNALS
Segmenting and organizing weak signals, macro trends and drivers for change.

04 DESIGN INTERVENTIONS
First person perspective on how design can create alternative reality.

06 SCENARIOS
Creating scenarios for possible future visions.

08 PROVOTYPING
Bringing the story to life by making, acting or filming.

01 HORIZON SCANNING
Scanning for weak signals, macro trends and drivers for change.

03 PHILOSOPHICAL PILLS
Looking at the futures through philosophical lenses.

05 CONSEQUENCES MAPPING
Mapping the consequences and implications that might happen to a particular issue.

07 FUTURE PERSONA
Creating future actors and target users.

DAY 01   DAY 02   DAY 03

▲ **Figure 2**
Outline of a 3-day workshop, PoliMi PhD Futures Thinkaton, 2020; I04: DESIGN FUTURES TOOLKIT, FUEL4DESIGN. (Image credit: Ammer Harb).

In Figure 2 we see one of the many initiatives enacted in FUEL4DESIGN to explore relational design futures pedagogies and their design futures literacies, in this instance a three-day workshop from the *PhD Futures Thinkaton* from the Politecnico di Milano partner. Shown here is a schematic outline of a set of design futures orientations and activities that were devised in the FUE4DESIGN work package **I04 DESIGN FUTURES TOOLKIT** to provide students access to some of the key tools developed in Futures and Foresight Studies and to explore their utility and applicability in working with ways to critically assess and apply futures tools as part of developing further individual and group based literacies and learning.

In line with the contextual view on multimodal design literacies presented earlier in the chapter in Volume 1, **Design Education Reconsidered**, the work of Kern (2015) addresses language-based education in terms of interactional relational pedagogies. He suggests a set of key principles for implementing educational relational goals. These are (Kern, 2015: Kindle location 6477ff): 1) Meanings are situated and relational; 2) Language, literacy, and communication rely on both convention and invention; 3) The medium matters; 4) Texts are always multimodal; and 5) Language, literacy, and communication rely on both convention and invention. Kern draws on these principles, much as we do at

the start of each essay, as a means to pose heurist questions to engage us in rethinking our pedagogies relationally. Though this is language-based work, it applies to our own DESIGN FUTURES LEXICON as working with instances of relational and contextual futures 'languaging'. Kern further addresses implications for the role of technology in language and literacy education, arguing that it should not be a goal in itself (Kern: 2015: loc. 7121) but part of an ongoing critical semiotic awareness. This too has been central to our own work and to thinking and learning in a relational anticipatory design pedagogy where language and contextually generative semantics and vocabularies terms are only one part of an intricate mesh of design based communication and futuring (see also Lockton & Candy, 2018).

Relationality is also taken up elsewhere in educational writing. In a reflection on John MacMurray's philosophy and its applicability to technologies in education, Facer (2012) pointed to matters personal (as in the individual), relational (interpersonal and agentive, as a resource for collaboration and friendship), and beautiful (namely reflective and contemplative). A similar view on relationality - as social, shared and amicable - is taken up by Gergen (2021) in *The Relational Imperative: Resources for a world on edge*. Drawing on his earlier work (Gergen, 2009), Gergen argues there is a vital and urgent need for us to act on challenges of climate and societal issues and where education has a key role to offer and play in responding to global and local precarity. Gergen discusses a relational view on conflict and co-creation and outlines shifts in responses over the past century as moving from punishment to bargaining to logical reasoning, suggesting that what is now urgently needed are peacemaking, caring practices (Gergen, 2022. 113-121). These he labels as: discouraging degenerative discourses, inviting generative scenarios, creating new realities, creating consciousness of commonality, and becoming the other. These suggestions resonate with the contexts and needs of meeting design futures challenges and potentials. Anticipatory design relational pedagogies are clearly in need of strategies and tactics to realise change and to constructively engage diverse parties to it, such as the focus on relational governance Gergen promotes.

In the recent *Relational Pedagogies: Connections and mattering in higher education*, Gravett (2023: 14) acknowledges the importance of relational pedagogies in university learning but stretches the common focus on multiple interactions between student and teachers, a human level, to focus on non-human actors and agency and their entanglements, at a level of matter. Gravett's goal is to experiment with a more radical relationality in addressing posthuman and other socio-material theories. We have pursued a similar path in parts of our project (see Zou, 2022; Snaddon, 2020, and the chapter Design Education Reconsidered) in exploring diffractive futures design and pedagogies, drawing on the work of Barad (2003, 2007), amongst others. For Gravett, this also extends to ethical relationality in acknowledging difference and diversity and their underpinnings [→ SEE Essay 2: Altering Prospective Design Pedagogies]. Gravett is critical of the heightened focus on individualism and instrumentalism in western societies and institutions of higher education; instead, she works to 'play with the multilayered concepts of connection, relations and mattering' (Gravett 2023: 17). For Gravett (2023: 227), teaching:

… is also relational in the sense that matter matters: material contexts, spaces, objects and things all entangle to impact upon the learning and teaching that happens. Mattering then is a useful word. Mobile and multiple in its meaning it can be helpful to us in reminding us that relationships matter, but so do the non-human things around us. It invites us to think beyond those well-worn cognitive, psychological and humanist tracks of thought that have dominated educational research and practice for so long.

On offer also is a history of the relational in learning and teaching in higher education (Gravett, 2023: 18-26) that provides additional citations and orientations to those we have referred to and to which readers may like to consult further. Gravett refers to key educators and writers, such as hooks (1994) and the notions of mutual recognition and presence, connectedness and selfhood (Palmer, 1998), student engagement (Gravett & Winstone, 2020) and the notion of mattering to students' lives as elaborated by Schwarz (2019), and others we mention above. Gravett (2023: 59) argues that her '… perspective reprioritizes values such as connectedness, relationality, collegiality, community, the micro, mattering and entanglement. This thinking takes place in the cracks that Bottrell and Manathunga describe (2019), and offers a source of activism.'

In summary, Gravett (2023. 28) writes that:

Additionally, while the literature has focused on the mattering of teachers and students, or students and peers, I believe that there is a further significant dimension of relationality that has so far been occluded from the discussions surrounding relational pedagogies, and that a broader conception of the relational is required if we are to understand learning and teaching experiences in higher education. Moreover, I contend that this is a frame which holds the power to upend the way that we think about learning and teaching altogether.

Such arguments are addressed further in **Essay 2: Altering Prospective Design Pedagogies** where we focus not only on wider issues in higher education but specifically on design institutional transformation. This is to do with change and ways to supporting the transformation of design education through ventures into futures-oriented design literacies and pedagogies. It's infused with imaginary yet pragmatic and open visions together with actual scenario-based transformations. These are futures in design learning that are conceptualised and enacted - relationally, creatively, critically and actively - to offer, pose and position, and to shape and to shape-shift meaningful, influential and long-lasting *Anticipatory Design Literacies* and *Anticipatory Design Pedagogies*.

Where we have consistently placed our work in an anticipatory 'systems-with-cultures' view [→ SEE **Essay 3: Sustainability, Systems & Learning Design Futures**], linked to open prototyping and unfurling scenario generation, to mention a few techniques, we have had to tackle a major shifts in working with and through a relational pedagogical perspective. The shifts have included entangled modes of in-person, face-to-face and physical materials contact and contexts, to online, digital pivots and electronic mediation of much of our project dynamics and processes. Through the project we have therefore adopted a broadly speculative-pragmatist approach that has allowed

the melding and differentiation of activity centred inquiry into ways design futures literacies and pedagogies might be realised further 8FEATURE 2; see also Marenko 20121a, 2021b).

A recent book by Ross (2023), entitled *Digital Futures for Learning: Speculative methods and pedagogies*, also takes up many of the educational perspectives we have outlined above and within and across FUEL4DESIGN and this book. This is a most encouraging confluence of views relationally speaking, as well as the attention Ross gives to the role of speculation concerning the methods and pedagogies of learning. In her view, speculation refers to not taking futures for granted and to active attention to ways participants shape them, and her volume is centred on digital technologies in learning and how they may be opened out in new and generative ways (Ross, 2023: 6). She defines:

> *… a speculative approach works with the future as a space of uncertainty, and uses that uncertainty creatively in the present. Working in a critical or questioning way with digital education futures requires methods that can bring particular ideas or issues into focus by envisioning or crafting conditions which may not yet currently exist, working to trouble established imaginaries.' (Ross, 2023. 13).*

Ross (2023: 139) continues:

> *Speculative methods in education research use approaches including fictions, researcher-made objects, design activities for participants and speculative analysis. Speculative pedagogies, beginning to be applied in a number of disciplines, tend to centre emergence, creative experimentation and open-endedness. In both research and teaching, speculative approaches reject the articulation of best practice, and the production of predictions, in favour of an orientation to the future that plays with tensions between groundedness, unfamiliarity, responsibility and risk.*

In closing her arguments and reflections on speculative learning, Ross (2023: 202ff) lands on four main thematics: 1) the relationality of learning needs approaches that can account for its complexity; 2) speculative research questions or pedagogical structures need space for unanticipated or surprising experiences or insights; 3) speculative approaches bring risk to research and teaching situations:; and, 4) working speculatively means acknowledging that representing knowledge differently creates different futures. Together, these allow us to venture, she urges, towards unknown and risky futures. These are also speculative futures that are beyond our grasp and engaging with them openly allows us to delve into more misty prospects. To do so with hope and intention, Ross asserts, is to reach beyond assumptions and comforts in the educational practices and framing we know and already enact.

In our view such a speculative approach, as the one Ross conveys, may be taken further into situating futures views and methods inside design education in which they are applied, developed and experimented with *by and through designing*. This highlights the roles of a design-rich view on speculative learning and knowing, where, as the

essays that follow show, the dynamic interplay between knowing and making draws on and extends beyond traditional academic disciplines and their rhetorical and mediational literacies and mixed, transdisciplinary and post-qualitative methods. An *Anticipatory Design Pedagogy* is itself a mode of 'multimodal composition' (Morrison, 2010) and linked, as we indicate in Essay 7: Learning Design by Making Futures and as Ross also mentions, to a 'compositional methodology' (Lury, 2021), that is a space that emerges across a problem space.

We conceive of an adaptive, flexible, resilient and futures engaged *Anticipatory Design Pedagogy* has at its heart not only compositional methodologies. It works transductively, that is with and through and realising relations between and within multiple materials, processes, dynamics, participants, systems and articulations. Together, in combination, relation and difference - by being risky and new, exploratory and prospectively suggestive, offering or altering, disrupting or problematising - these are also designerly in their anticipatory articulations. This is so structurally and communicatively, emblematising thereby their aesthetics, rhetorics, performativities and ethics as *reaching toward alternative futures through designing*. For example, in Figure 3 we see the outline of a Miro based workshop activity from IO4 DESIGN FUTURES
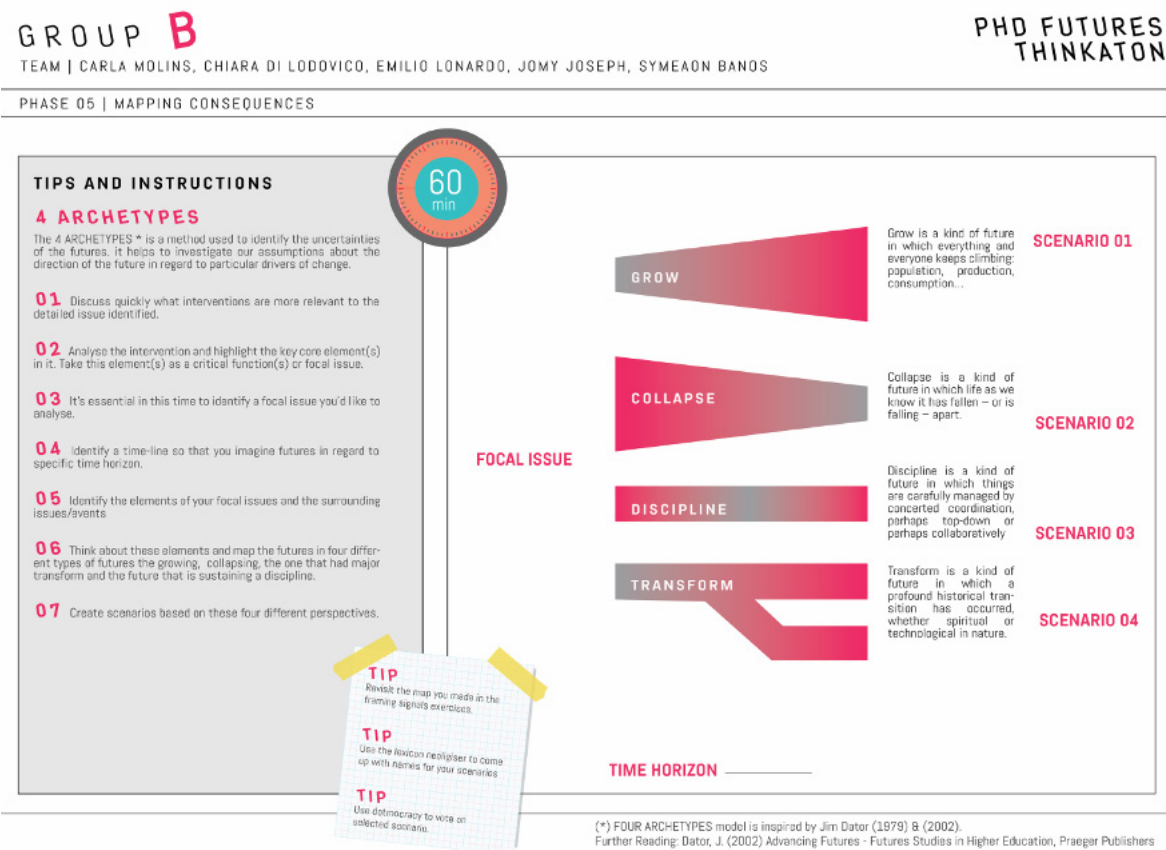
◀ **Figure 3**
Online group work in Miro, 'Mapping Consequences'. PoliMi PhD Futures Thinkaton, 2020; IO4: DESIGN FUTURES TOOLKIT, FUEL4DESIGN (Image credit: Ammer Harb).

ESSAY 1   ANTICIPATORY DESIGN LITERACIES

TOOLKIT developed to both draw students' attention to tools from Futures studies, in the case of the Four Archetypes model from Dator (2002), and design futures view on its links with scenarios and supported by three tips as to how to use resources from related work in this module as well as from the NEOLOGISER in the DESIGN FUTURES LEXICON.

On relational anticipatory design education

In order to do preparatory, projective and reflexive work on shaping our possible, potential, and preferable futures - ecologically, culturally, technically, communicatively - futures oriented design education needs to continue to engage with both historical and contemporary needs and issues, and their related constructions and projections. However, it needs to do this to reach into anticipatory and imaginary perspectives and experiences so that we may return to present-day contexts, designing, related analysis and situated engagement through which to make informed yet creative moves towards better futures. Yet, this is not that straightforward when we cannot escape the paradox of trying to work in an anticipatory mode of knowing and becoming while the future is always just beyond us, beckoning (and mocking) us in its shadowy lure and constant ephemerality.

While needing to retain a strong measure of educational and societal hope, such as argued by the philosopher Bloch (1986) - even drawing forth the utopian and a needed psychological and organisational ethos and practice - for those learning, teaching and working with design, from industry to the public sector to research and policy, our primary goal in design anticipatory pursuits must be to secure survivable, sustainable futures. These need to be ones that we can shape in the present and allow to flourish and generate possibilities for those human and non-human beings and systems that come after us. Such 'postures', as we might call them, or, to consider them more generously, efforts and offerings, ought not to predetermine, decide and lock in choices and decisions in the very short term. Here, in the design professions and in master's education we meet very real pressures to provide responses and solutions to acknowledged critical needs and decisions.

However, the 'problem', as mentioned above, is seen as a form of immediate solutioneering. This 'design-as-salvation' view many design educators and education design researchers now argue has led us into the precarity that our societies and polities along with deep threats to biodiversity and environmental degradation. Solutions cannot address one aspect of a wider product delivery chain, for example, or isolate a service experience without seeing its deeper systemic infrastructuring. In the FUEL4DESIGN work package IO3 DESIGN FUTURES SCOUTING took the metaphor of venturing central to the project as a whole into a mesh of individual and collaborative student learning designed around an Atlas of Weak Signals.

This can be seen in Figure 4 in which is profoundly illustrative of design futures pandemic pedagogies. Gloves, masks, social distancing. Pin boards, diverse images and own productions in an assemblage of personal composition. Multiple items situated in a wider spatial communicative ecology. Hands, eyes, postures and actions. Scissors. Pins, thick twine, pink tape and thin string. Proximity to the paper and 2-D interface

in a process of becoming. Attention to a specific edit by the student on the far left, a selection and its placement centre image. Two students watching others in acts of making and shaping selections and relations. In the corner a computer monitor, and its implied and invisible relational pathways between the digital and the physical, the imaginary and the tangibly mediated.

A tableau of action and reflection, of working together form students' own first-person perspectives into modes of materialising collaborative documentation and the texturing of 'swarm intelligence'. Being visible in acts of shared becoming while working with design project characteristics and articulations from personal work and pointed scale to the rhizomatically collective and expansive Spaces of different processes being connected and through different minds and yes and hands and gestures. Time of project development compressed into a zone of layered mapping and networked thinking with action and pauses, diverse contributions and participative principles. Our challenge as educators and as students, as this one collaborative learning event

◀ **Figure 4**
Collaborative Documentation and Swarm Intelligence session, 16 November 2020, ELISAVA. In detail, students were asked to frame their prototypes and experiments in relation to their area of interest provided in the Atlas of Weak Signals (for more information about the AWS, refer to the article published in Temes de Disseny) and make these relations between students visible. (Image credit: ELISAVA).

indicates, is hugely about negotiating how to ethically and creatively shape design futures in order to negotiate transitions and change in and over time, and to look to time as a design material [→ SEE **Essay 3: Time, Design and Futures Pedagogies**].

We need to limit or curtail destructive policies and practices (already extending in time in their consequences). We also need to generate and imagine the very ways and means to engage productively in which anticipatory choices, designs and ecologies may be realised and where these are situated in durative, responsible actions (temporally distributed, poly-chronological, options in their anticipatory reach and security). Such

anticipatory acts are ones that we need to face head on in living and working in today's world, not in some imaginary terraforming of Mars. Yet design imaginaries, need to be understood not only as anticipatory systems and schema but also as anticipatory cultural articulations in the forms of products, services, systems and interactions, and un/disciplinary and inter/transdisciplinary activities. Anticipatory learning events are themselves ontological spaces and acts of change and they can and may continue to happen in design futures pedagogies that script and stage possibility spaces that allow the dynamics of design materialised futures literacies to flourish.

For Brassett and O'Reilley (2021: 18) a diversity of modes of anticipation themselves may be understood as ontological transformations within our emergent approaches to studies of anticipation. In their view, 'Anticipation is the capacity of futures studies for opening up to the multiple modes of future becoming, beyond the corporate 'unreal estate of the future', to making futures that are creative, ethical and lovely.' (Brassett & O'Reilley, 2021: 18-19). *Creative. Ethical. Lovely.* Teaching and learning design futures literacies in the past three years or so may have often seemed far from these three terms and their constructive, exploratory and, at times, risky experimentation. Yet they matter immensely in working with and in and through futuring in design education.

To achieve such hopeful and aspirational futures, that is through teaching and learning design, by way of design practice, and in crafting critical and situated design research, we need to be engaged in multiple, linked and bounded acts of creating, doing, experiencing and critiquing. For us, there is a necessary performativity here in order to grasp at, to work towards and to engage in so that the 'what-if' of what will continue to be intangible futures and future potential potentials may be further realised as what might and can be done back in the present and its reach into alternative futures.

These are futures schemas in a sense that we then experience - from a passing sniff to a full-blown somatic overload s it were – so that we use design refuturing as what may be understood as a recursive ontological anticipatory design material. To hold these states and processes, engagements and reflections open to deep and critically creative learning - not in suspended disbelief as design fiction work so often claims - interesting and productive as that may be - asks that we take up with the speculative as a mode of inquiry that is only possible for what we have become and are. To do so asks that we take stance of engaging with processes, acts and activities of 'becoming' that not only allow for but encourage anticipatory designerly modes of teaching and learning how to engage in shaping shared long-term different futures.

This is conveyed in 'Crafting a Speculative Space in a Pandemic' [→ SEE FEATURE 2] in which Betti Marenko considers and reflects on how expectations and experience of attempting such design anticipatory education played out, encapsulated here in one of the early public events held by the project. The example is from a project blog post and it indicates the value of a variety of modes and styles of communicating about the project online that here further refers to digitally mediated events concerning the forced pivot from physical to digital communication. The feature is indicative of the engagement of project teams and the team as a whole to engage critically and reflexively on their own

Crafting a speculative space in a pandemic

BY Betti Marenko

BLOGPOST: 22.01.2021. **Link** ↗

As the PI of the Future Philosophical Pills **Link** ↗ I found myself in the unexpected and slightly paradoxical situation of being right in the middle of a project about future speculation, the unknown and landscapes of uncertainty when the project was derailed by the onset of the current pandemic. Suddenly, the very instrument (the Future Philosophical Pills) that we were developing at UAL with the purpose of amplifying the range of potential futures that can be imagined, anticipated and speculated upon, hit, quite literally a wall. With Covid-19 brutally rewriting our present, the notion of future we were handling in our intellectual output had to be re-assessed.

It's March 2020. The UAL team is due to host Speculative Space, a three-day training event for a large international group of design educators at the Design Museum in London. A key purpose of this event is to present the Future Philosophical Pills and introduce them to our colleagues with a series of hands-on training sessions. The idea is to live test the deck of cards we have created in the previous months (through

▲ **Figure 1**
Preparing the cards for Speculative Space: Betti at Central Saint Martins, 5 March 2020 (Image credit: Jerneja Rebernak).

a series of iterative workshops with our postgraduate students – *see Silke Lange's blog post 'Hacking Futures – Futures Hacking: reflection on co-created futures'* **Link** ↗). The cards offer a way to interrogate and craft potential futures, using an inquiry into chance (the random draw of the card) as an opportunity to build meaningful, unexpected and open-ended trajectories

of knowledge production around futures. We have designed print-and-play card prototypes and assembled a number of hard copies of the decks for immediate play. We are ready.

The pandemic forces us to put our future-crafting strategies on hold.

Our *Speculative Space* event is cancelled. Indefinitely postponed. All our energies and resources (both institutional and individual) are diverted to emergency remote teaching. The entire world enters suspended animation. The lesson cannot be more ruthless. No, the future cannot be predicted. Yes, future-proofing is an oxymoron.

There is a certain irony (which doesn't escape us) in an endeavour like the Future Philosophical Pills being disrupted by an unanticipated global event. A twist of fate perhaps. What matters, though, is that it both humbled and spurred us in renewing our work around futures. If it is true that how we think about the future cannot protect us from the pure contingency of its manifestations, what it can do is to amplify the range of intellectual, imaginative, anticipatory, pragmatic means at our disposal to craft appropriate, enriching, and most of all nimble responses.

Like everyone hit by the pandemic, our team had to adapt, rethink and reorganise. Deadlines were being pushed forward to accommodate sudden and unrelenting demands on our time and resources, both professional and personal. As an educator involved in teaching large international cohorts of product design students at Central Saint Martins, I quickly realised the huge difference between emergency remote teaching and the complexity of the demands of remote learning, remote collaboration, and remote community building. Writing this reflection in January
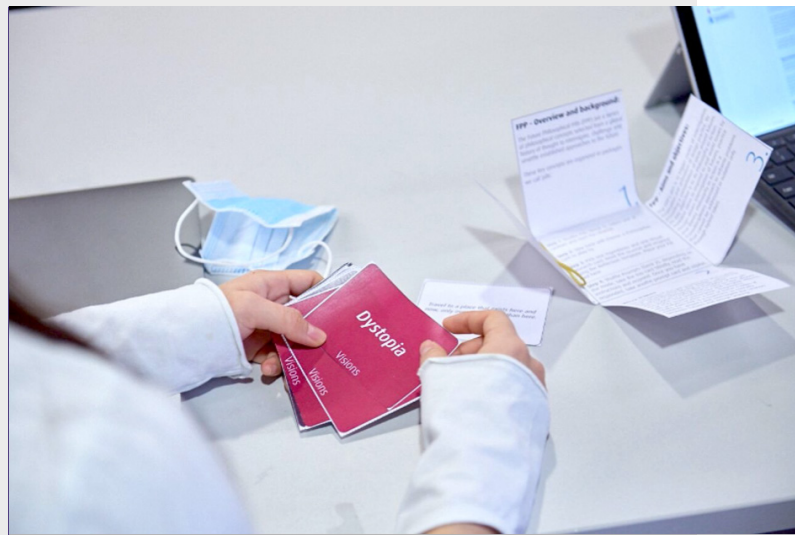
▲ **Figure 2**
Students workshop Central Saint Martins, 6 March 2020 (Image credit: James Bryant).

2021, if there is one thing that the past ten months have made abundantly clear it is that teaching and learning online are not and cannot be simply a matter of uploading the same content only to a different medium/platform. We are dealing with an entirely different landscape that requires rethinking methods, fine-tuning our modus operandi, conventions around temporalities and scale, even the rationale behind the initiatives we are hosting, and certainly the modes of engagement we put forward and expect from the participants (students, learners, peers).

When *Speculative Space* finally happened in October 2020 not only was the world a rather different place; our shared expectations of what an academic gathering with a focus on building a pedagogical experience had also morphed to adjust to the new normal. What is more, the palpable lack of control evidenced by the pandemic had the effect of unhinging those notions of the future as a somewhat 'chartable' landscape. Suddenly one of the key drives of our project – how to use uncertainty as a material to work with, and deploy the unknown as an opportunity to create meaning – became a goal (or at least a buzzword) shared world-wide. Thus,

Speculative Space shifted from being the intellectually on-trend title of an academic future-oriented event; it became the emblematic qualifier of a new present. What emerged was the realisation that a radical rethinking of pedagogical instruments, epistemological methods, and ontological underpinnings of the 'future' itself was needed.

The future is dark,
which is the best thing
the future can be, I think

Virginia Woolf, January 18, 1915

Speculative Space was hosted as an entirely remote event over two days in October 2020. This meant drastic adjustments to the planned structure, content and format. Our team used a combination of digital platforms to deliver it: MS Teams (with different channels for each working group), Miro boards (for collaborative workshop activities) and Simmer (hosting a prototype of the interactive Future Philosophical Pills). In fact, the whole event may be described as a prototype of sort, as none of us had ever hosted, produced and implemented a multiplatform event of this kind. Undeniably, there were technical challenges and the learning curve was steep. Still, the event managed to mobilise the content we had planned, and engage participants in working their way through the deck of cards, debating the intersection of futures with some of the key concepts proposed by the cards, and furnishing us with feedback for iterations.

Since then, between October 2020 and January 2021, I have hosted several more Future Philosophical Pills workshops in a wide range of contexts and scale: embedded as tailored course material for Product and Industrial Design Link ↗ undergraduate students; as part of the Politecnico di Milano-hosted *Thinkathon* for doctoral students; as brainstorming/speed-dating activity to kickstart the collaborative Hybrid Futures Hackathon Link ↗ part of the Digital Innovation Season Link ↗ at Central Saint Martins; as prompting/reflective tool for the postgraduate and PhD students at Tokyo Institute of Technology enrolled in my course Hybrid Futures: Designing for Uncertainty, Designing for the Post-Anthropocene Link ↗. In particular, within the highly transdisciplinary context offered by Tokyo Institute of Technology the Future Philosophical Pills participate to the ongoing research around hybrid methodologies, across art and design and science and technology, bringing together practical philosophy, the critique of technology and 'future-crafting'[1].

The salient characteristic of this approach concerns working at the hinge of the speculative and the pragmatic to develop intellectual interrogations that can

scaffold tangible design-led interventions, which in turn are able to feed back onto speculation. It is important to stress this point: the speculative and the pragmatic are not opposed to each other. Pragmatic doesn't mean practical as opposed to speculative or theoretical. Here I draw on what philosopher Brian Massumi calls *speculative pragmatism*[2]: how we stay open to invention and future making (speculative) while staying close to what is happening, the how, the method (pragmatism). The 'how' is crucial. It means that philosophy in action is in the business of activating ideas through prototyping techniques that engage with what does not exist yet; that turn uncertainty into modes of knowing; that use uncertainty as an opportunity to create meaning. This is an approach that is not afraid to embrace the unknown, and that boldly asks us to generate multiple routes of 'figuring out'. It is precisely this capacity that has been thrown into stark relief in the course of this project in 2020. Not only did it turn *Speculative Space* into a (unexpected) meta-project. It made us alert, more than ever, to the fact that our instruments of knowledge-production are not just reflecting the contingency of the world, they are that very contingency.

Notes

[1] Marenko, B. (2020). 'Future-Crafting: The non-humanity of planetary computation, or how to live with digital uncertainty'. In Witzgall, S., et al. (Eds) *Hybrid Ecologies*. Chicago: University of Chicago Press / Diaphanes. 216-227.

[2] Massumi, B. (2011). *Semblance and Event. Activist philosophy and the occurrent arts*. Cambridge: The MIT Press.
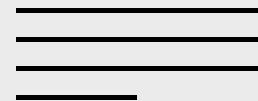
changing and adaptive work practices and the roles of participants to platform shared venues and events where our own pedagogical modes of becoming were presented and discussed.

Further attention to relations between the ontological and the methodological and the interplay of the making and enacting of design futures pedagogies and design-research future framed methods, is covered in Essay 7: Learning Design by Making Futures and in Essay 8: Tools, Means and Mediating Design Futures.

Design-learning through 'dark futures'

In locating an anticipatory design view on design futures literacies in relational and transdisciplinary ways, it is important that we go beyond a walled-garden view of our own design expertise, practices and knowledge. Rather, we argue, what is needed is that we accentuate the potential and actual engagement with design and futures that goes beyond dampening to a crowing from its borders inwards and outwards that we will simply and always work to provide solutions.

In design research terms such arguments are well versed, rehearsed and received. It's time they were also better appreciated and within a more substantial, informed, shared and wider ecology of interrelated discursive and enactive designing and knowing.

This is a serious challenge to voices in design that all to quickly say that 'It's designers that find solutions', who matter-of-factly support such a view in locking down potential and open status investigation in the restrictive 'That's what we do' and when such voices may not articulate or be in positions to deconstruct the very problematiques to which they contribute.

In *After Lockdown*, Latour (2021) refers to Kafka's *Metamorphosis* and the persona of a hard-backed insect that his central character Gregor finds he has become on awakening one morning. Contained in his apartment, ordinary life is inverted, and movement restricted. Embodied in this human/non-human persona, argues Latour, are the framings of our fragile, human contained experience in which 'Kafka hit the nail on the head: becoming a bug offers a pretty good starting point for me to learn to get my bearings and to now take stock.' (Latour, 2021: 4). This 'making an account' takes place in Latour's later work in the context of understanding human and non-human relations in non-binary terms in the wider context of climate and planetary level systems change.

Many of Latour's observations in *After Lockdown* apply to design education in which, in many respects, we are curtailed by our own values ecologies and infrastructuring logics. In contrast, Latour reconsiders the lockdown logics and experiences of the COVID-19 global pandemic, and its challenges to our lived realities and the unequal distribution of vaccines and skewed global access to public healthcare and calls to action.

He writes that:

> It's this 'return to earth' business that's got my head in a spin. It's not fair to push us to come back down to earth if they don't tell us where to land so we don't crash, or what will happen to us, who we'll feel affiliated with or not. I was a bit too quick off the mark. That's the problem with starting with a crash site, I can no longer position myself with the aid of a GPS; I can no longer overfly anything. But this is also my chance: it's enough to start where one is, ground zero, and then try to follow the first track that crops up in the bush, and see where it takes us. No point hurrying, there's still a bit of time left to find a place to nest. Of course, I've lost my nice stentor's voice, the one that used to hold forth from on high addressing the whole human race, offstage; like Gregor's to his parents' ears, my diction is in danger of sounding like mumbling, that's the whole problem with this becoming-animal. But what counts is to make heard the voices of those groping their way forward into the moonless night, hailing one another. Other compatriots may well manage to regroup around those calls. (Latour, 2021: 7).

What then, as it were, is our design education as becoming-creature? How is it construed and who speaks as and through it? What is articulated and how might we gather around matters of care and concern (Puig de Bellacasa, 2017) that help fuel our relational practices?

To follow this through, and perhaps as a less direct bio-semiotic challenge to design, let's turn to one recent publications in art, a nearby and intersectional domain for design, that offers us similar and accessible engagements with the ontological and epistemological in a wider relational view.

Witzgall (2021) elaborates on relational onto-epistemologies as ways of being in the world in the context of contemporary art practice and theory. She argues for attention to ecological thinking and how it may be understood in regard to wider approaches and engagements in relational thinking and practice. These are ones that may be positioned within what has been termed 'a relational turn' that works against a modernist, instrumental and subject-centred paradigm (Witzgall, 2021: 74). For Witzgall, S. (2021: 73):

> In the new relational approach sketched out here, the signs, tools and practices of representation are inseparably entangled with the other semiotic-material actors that make up their assemblages and networks. In this way, they do not only participate directly in the differentiation, or individuation, of the phenomena and things to which they are directed but also are themselves determined by the relational processes involved.
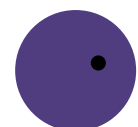
3.
PLURALITY AND FUTURES KNOWING THROUGH DESIGN

BY Andrew Morrison & Manuela Celi

What futures, whose futures?

For design educators, designers and design researchers speculative design futures literacies stand in contrast to prevailing approaches to futures as a field of research under the banner Futures Studies. These approaches may be characterised by attention to planning and strategic decision-making. They reflect historical and contextual influences and world views around 'managing the future' (e.g. Gidley, 2017; Andersson 2018). These may be broadly read as a mode of problem solving. While such views might indeed be oriented towards addressing system and pressing issues, they tend to overshadow approaches that open out speculative spaces, activities and mediations as ways to work with uncertain and unfolding futures. Mazé (2019: 27) reminds us that:

> *In design practice, rhetoric of futurity is prominent in various genres, even if political dimensions are not made explicit. For example, the future is at stake in 'concept design', 'critical design' and 'persuasive design', as well as in other genres not further elaborated here such as 'speculative design', 'design futures' and 'transition design'. As I discuss elsewhere (Mazé, 2007), concept design, critical design and persuasive design are not definitive categories in design discourse, since examples are not easily or exclusively identified and terminologies are highly contingent, and since positions are continually renegotiated and reframed. For explanatory purposes here, these are elaborated in over-general terms, as tropes through which to discuss ways in which design may aspire or claim to project, challenge and steer the future, in order to expose some political dimensions.*

Escobar (2018) has urged us to rethink our conception of the future as plural. We need to ask what and whose futures we are taking part in and to what ends. This extends as well to wider acknowledgement that the future is also being colonised, occupied and promoted out of vested and inherited interests and power configurations. Ways we can work with futures and support our students to do so creatively and ethically demands that we also unpack the wider discourses and devices through which futures views and disciplinary takes on futuring as arranged and disseminated [→ SEE **FEATURE 3**]. Adam (2021: 123; original emphasis) writes that:

> *To engage with the future explicitly means we have to consider what entity we are dealing with. This means we need to consider whether the future is a sphere of purposive action, transaction, or interaction. Is it a sphere of mind, imagination, or language? Is it a sphere of*

ideas, beliefs, and knowledge? Or is it a sphere of morality, ethics, values, and obligations, or a sphere of freedom, choice, intent, and instrumentality? We need to ask ourselves further whether we think the future is embodied or abstracted, real or ideal, material or immaterial.

A plural futures view translated into an anticipatory design pedagogy is centred on and realised through problem posing, prospective design-based options and modes of working and knowing that encompass the contingent and the emergent (Marenko, 2018). One of the PhD participants to our many events, Jomy Joseph, from India and shaping his doctorate at AHO, comments in his work as follows:

The future we create will need deep conviviality, autonomy and cooperation, which may help us make and remake the world just as intimately as we normalize the arrival of climate dystopias today. … The prospects of a long-term sustainable civilization worthy of the name, if there ever is to be one, may yet depend on the possibility that the human species, with all its ingenuity, realizes forms of becoming indigenous to its life-giving biosphere. (Joseph, 2021: 112).

Figure 5 ▶
'Artefacts from the Pluriverse-Shaping Sustainable Futures' Exhibition. (Jomy Joseph, PhD fellow at AHO, Oslo; Zhilong Luan and Xia Nan, PhD fellows at Tsinghua University, Beijing). Part of the ReFuturing Studies: Investigating Ecologies of Climate Action, exhibition and seminars, AHO, 25 November-3 December 2021. Supported by the designBRICS project, AHO. (Photo credit: Jomy Joseph). [Link ↗](#).

This is where working with and towards long-term survivable and sustainable futures - in the contextual clusters of complexity and change - may benefit from being recast, reconditioned and reconfigured [Figure 5]. Even at this point (as these last three verbs indicate), one can see that working in a mode of anticipatory designing asks that we take an active, exploratory and formative role in shaping specifically design futures. Such design futures are prospective, recursive and critically repositioned views on futures that are themselves plural and always just beyond tangible grasp.

In the face of crisis, change and complex contexts, the ontological (world views; meaning) and epistemological (methodological; pragmatic) characters and uses of perspectives and approaches on futures need close, careful and critical scrutiny and strategising. This is no small matter for design students, educators and researchers.

Without our own attention to such matters, it's hard to see how others outside of the actual dynamic of designing can make full sense of what this might mean. Mazé (2021: 278) reminds us, referring to a book she co-edited, that:

> In Feminist Futures, *we argue that feminist futures are 'becoming' when common projects—e.g., a canon, curriculum, project, or conversation—not only momentarily produces an alternative space, but effects new connections and social relations that can alter ingrained patriarchal structures as many of us still experience them.*

Altering a set of interlinked, ingrained structures and practices is central to shaping more equitable and inclusive design futures literacies and pedagogies. These changed curricular and pedagogical formations need to be transposed into events and actions, experiments and experiences. They take place (and it needs to be noted), however, in contexts in which predominating and ideologised neoliberal political economies of more growth and exploitation of material and human resources and related policies position and limit world views. They may be actively configured to constrain and even curtail design-driven ventures into shaping design futures learning experiences and paths to conceptualising and actioning urgent needs and long-term equitable and sustainable change through designing.

The work of Betti Marenko and her UAL team on the FUTURES PHILOSOPHICAL PILLS [→ SEE Part II. Positioning] works relationally in engaging participants through serious play to better identify world views, assumptions and positionings in their design projects and the design discourses they encounter. While developed out of a canon of western continental philosophy, the PILLS have also been generated by a design scholar and theorist who works in critical studies of digital technologies and cultures, including in Japan. This work has also naturally informed the wider orientation and character of the PILLS. The intention with the PILLS is to fulfil a second phase that draws on a corpus from the Global South thereby extending the co-design of its contributions to building additional plurality into relational anticipatory design learning resources.

Similarly, the DESIGN FUTURES LEXICON acknowledges vocabularies and their workings in, as and through discourse (the articulation of meaning above the level of the sentence) and its further multilingual and poly-cultural development [→ SEE FEATURE 3]. Further examples of 'tools' and uptake from these two work packages are located thematically in the essays that follow.

To focus for a moment on a doctoral design student outcome, the two examples of Jomy Joseph's doctoral work shown above in this chapter straddle and entwine physical-digital, visual and verbal narratives and exploratory design futures multimodal rhetoric. They work relationally to offer and to propose ways to work ontologically and to think through ways design futures are conveyed and communicated. They suggest and beguile us to venture forth on our own. They open out spaces to think with and through the tools and environments they mediate and how we might further our own senses of the emergence of the 'what-ifs'. Here too we are shown and even shaken a little, asked

to be present and to be critically active and open to what is being conjured and cajoled out of the past and the present into a subjunctive and anticipatory relational way of thinking and learning and communicating.

In entering into these 'speculative spaces', as Marenko outlines in FEATURE 2 here, we have invited students and colleagues to engage in processual and ontological acts of relational anticipatory design. This includes designing, learning, teaching and analysis where the hyphenated designing-learning generates its own energies and possibilities and where recursively and watchfully we all need to continue to mind the choices, uses and implication of the views and vocabularies we select and work with to actively use futures in design education. This connects with themes in other essays, such as care, sustainability, and agency. It also asks that we work critically with notions of design imaginaries as part of design futures literacies in the ways we approach and embody futures in our pedagogies and in transforming their wider institutional and social and communicative reach and influence [→ SEE Essay 2: Altering Prospective Design Pedagogies].
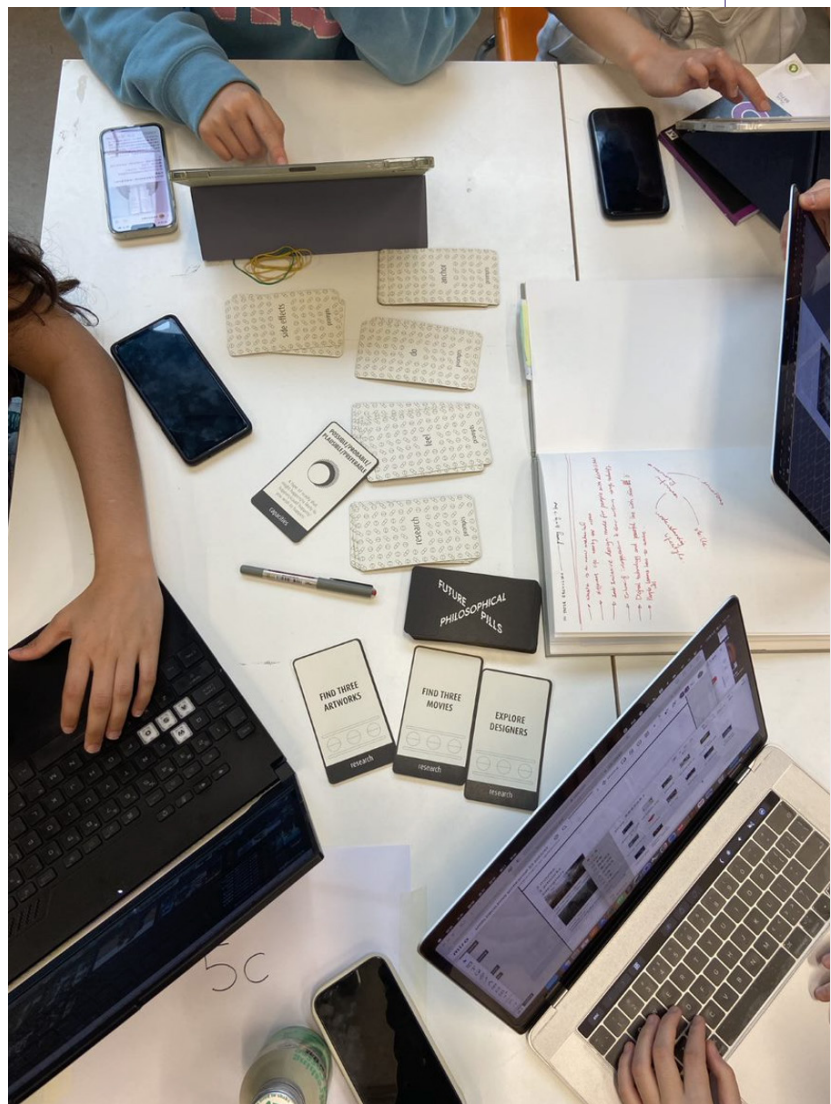
Figure 6 ▶
Postgraduate students from a range of art and design disciplines taking part in the Future Philosophical Pills workshop at Central Saint Martins, UAL, 6 March 2020. (Image Credit: James Bryant).

Framing Futures

EXTRACT FROM: I05 Unit 02
– Voicing Fluent Futures.

AVAILABLE: Link ↗

UNIT 02 - VOICING FLUENT FUTURES

UNIT CONTENT

1. FRAMINGS OF FUTURES

Futures concepts and contexts
Gidley (2017: KIndle) writes that 'The future has been prophesied, divined, imagined, colonized, feared, forecast, strategized, and created. As multifaceted as humanity itself the future can never be fully known, predicted, or controlled, but it can be better understood.' So how might the future, or rather futures as it is now commonly referred to, be better understood? And whose futures are these and who owns them? (For one view, see: Jarnier 2013). How do they matter to design teachers but also to our students as young citizens? (Gidley & Inayatullah, 2002).

This Unit seeks to facilitate sensitivity to and fluency with how work around 'futures' has been developed. Here fluency refers to being able to articulate 'a design futures view' verbally and in relation to multimodal expression, rhetoric and critically positioned worldviews in a design work or project (see Unit 9).
How we select approaches to 'futures' and related methods may inform, identify and support ways we can teach, learn and work with futures in a futures-by-designing mode of making and knowing. (see PHILOSOPHICAL PILLS). Contemporary futures views are pluralistic and participative and are concerned with alternatives not predictions. We need to examine their genesis, methods and circulation

Alternatively, Adam and Groves (2007) provide two thematics that may guide us: The Future (Told, Tamed, Traded, Transformed, Traversed) and Futures (Thought, Tended, Transcended). In centring on methods in Design Futures Literacies, we alter result type past tense verbs to gerunds or '-ing' forms (Lury, 2018; Unit 1). Processes, action and agency are essential to how futures may be shaped and 'voiced' via concepts, language and multimodal discourse.

Futures: plurality and positionality

Today, the future is considered to be plural (Escobar 2018). Futures need to be examined for diversity and for their positionality: historically (Rosenberg & Harding, 2005; Adam, 2010; Jameson, 2007), socio-technically (Dourish & Bell 2011) and culturally (Appadurai, 2013). Augé (2014: Kindle) writes that, 'Including oneself in the knowledge of what is (the ethnologist's multiple journeys make the task easier) means making progress, embarking on a route and understanding that the movement itself is both the means to knowledge and its object. '

In Design Anthropological Futures, Smith, et al. (2016) considered multiple and heterogeneous relations of futures and cultures: as a multiplicity of ideas, collaborations into possibilities, futures in and of design anthropology, and dominant takes on 'singularity, linearity, locality and novelty' (Gislev Kjærsgaard et al. 2016: Kindle). Acts of positioning knowledge to methodologically open out spaces for the possible are central. Moti (2019: 16) argues that 'a) the future is not trivial, b) the future has priority now, and c) the future is open to critique.'

Mapping Futures Studies

'Futures' are realised within the domain areas of Futures Studies, Foresight, Anticipation and more recently Anticipatory Design and Design Futures. Needed is examination of the histories of futures (Adam; 2010) argues and approaches and processes in reframing futures (Jarratt & Mahaffie, 2009). Many of the futures methods we meet are from Futures Studies: a research field within which foresight research sits, but equally in the practical work of foresight practitioners. Gidley (see e.g, 2013) has a five-part taxonomy of approaches to futures studies. This categorisation is contextual, not linear, and may in effect be used inter-sectionally

UNIT 02 - VOICING FLUENT FUTURES

UNIT CONTENT

by designers, teachers, futurists and researchers alike: 1) Empirical-Positivist, 2) Critical-Normative, 3) Cultural-Interpretative, 4) Empowerment-Activist, and 5) Integral-Transdisciplinary. For an elaboration, see World Futures Studies Federation site https://wfsf.org/about-futures-studies/). Gidley has recently updated this mapping. From FUEL4DESIGN, we argue (Morrison, et al. 2021) there is a need to interrogate the modes of design ideation, cultural and technical imaginaries, and mental and material projections of futures.

Futures, imaginaries, time and transformation

Sardar (2021a: online), writes that the 'Future is about time: it is about how we perceive time in our lived present, it is about memory and anticipation, it is about how time is presented in our worldviews, it is about how we give meaning and a sense of direction to our lives, and it is about collective undertakings. Time itself is, of course, all about change.' Haraway (2016) coins the notion of the 'thick present' on the now as lumpy and fibrous, one that is linked to the past but not an 'instant' present. This concept raises important potential for design making and inquiry: it asks us to explore assumed (modernist) notions and practices of linear time, directive planning, and strategic decision making (prominent in Foresight work). Key futures concepts are presented in a process framework taxonomy (Voros, 2003; Voros, 2017: online) with nested classes: preferable, probable, projected, plausible, possible and preposterous. Voros (2017: online) notes that 'This taxonomy finds its greatest utility when undertaking the Prospection phase of the Generic Foresight Process…'.

We may also ask and shape futures in which past-present-futures relations are dynamic assemblages, re/configurations and enactments of designing and contexts

of situated and emergent collaborative and collective (re)use. On working with language and time, see DESIGN FUTURES NEXUS and UNIT 2.5. FUTURES DESIGN, WORDS AND TIME. Tibbs (1997) proposed a 'psychological landscape of the future' and three types: cognitive, affective, and conative (Tibbs 2020). These we can use to develop methods and pathways in shaping futures pedagogically and methodologically, e,g. through scenarios.

Political economies of futures are influence expectations of consumption, imagination and change. Beckert (2016: 285) writes that 'Modern capitalism entails much more than instrumentally rational actors and calculative devices—it includes the creativity expressed in imagined futures'. Yet, these are futures infused and even co-opted by the methods and means we shape futures by design; Frase (2016) proposes 'mixing imaginative speculation with political economy' in a post/industrial model of four futures (communism, rentism, socialism, and exterminism). Sardar (2021a: online) positions futures in a frame of postnormal times where '… the future is represented as three tomorrows, which are simultaneously distinct and diffused: extended present, familiar futures and unthought futures….. Time in the framework of three tomorrows is complex and contradictory, characterised simultaneously in the singular as well as plural – time and times.' Our futures, likely or imagined, near of remote, sort or long term, may be realised via a variety of means and methods. In addition to the other Units here, the LEXICON offers a diversity of tools and methods for working with futures, time and the articulation of shaping futures by design.
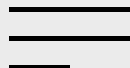
4.
LEARNING DESIGN FUTURES IMAGINARIES

BY Andrew Morrison

Imaginaries and dialogue matter for design futures

Here's a thought to consider. Learning is a mode of design future imagining. Our design future literacies and pedagogies can only proceed transformatively with continued attention to the interplay, the creative, and design imaginaries and contexts and systems of their making, that is of the conceptual and the pragmatic, between 'fabrication' and finance, and through changing relations of innovation and market where value is plural and ethical, not merely monetary. We will need to continue to make and buy and sell and consume, But it is how we do this and how design's imaginaries may be a part of working to make this possible and actual. Art and design schools have such imaginaries at the core of their education and preparation of students for working in a complex and changing world. We take this up in institutional terms in Essay 2: Altering Prospective Design Pedagogies.

What is at issue for a view on Anticipatory Design Literacies is that we make more explicitly the contradictions and possibilities in the contexts and connection within which we work. Without our creative inputs to such education, without modes of engaging creatively with criticality in working with and through design futures imaginaries we will not be able to contribute through design to alternate, different, emergent and preferable futures. It is as if we are now aware of the future that has ruptured the present but we have not collectively joined creative forces to do the painful and reparative work of suturing together another professional and transformational educational platform through which ongoing imaginative contributions may be made into and through processes of critical and situated innovation and change. This may sound idealist, even utopian and dismissive of clear pragmatic work to achieve such change, but without connecting the imaginary, sustainable and systemic in and as and through designing our design futures literacies will be the weaker.

Needed then is visionary and challenging work, playful and engaging, edgy and quirky, even deviant and disruptive in proposing with exposing, offering while discomforting, reaching and rippling towards a flourishing and wider and durative regenerative and systemic practices [Figure 7]. These demand pedagogies of openness and risk, of options and difference, of working with change as material, of engaging with difficulty and uncertainty, and, frankly, in seeing all of these - and others we perform and might find - as to do with design learning.

Yet this asks that we do some delicate work perhaps, as educators and researchers. It suggests that we place high value on such work of unlearning the givens and the assumed. It depends on us being able to open out imaginary design spaces of possibility (Nygaard Folkmann, 2011). Needed too are collaborative projects with industry and public sector partners, policy-makers and STEM actors in which we actively and deliberatively work to position design as working towards alternate futures in shared meaning making.

Here there is the danger of design imaginaries, with their offerings of optional pathways and diverse scenarios, too quickly being curtailed and dismissed by design itself where working with difficulty and uncertainty is displaced by the adage that design works with solutions. Solutionism and 'solutioneering' (that a problem solved solves the conditions and contexts of an issue or a need) are not the direct and immediate answer but may perpetuate the problem.

So, an anticipatory dialogical design, drawing on Dewey's pragmatism but folding to with and into a speculative creative designing, is one open to using design imaginaries as material and means for future shaping, is discursive in its workings and inclusive of futures as plural. It acknowledges the need to recognise a diversity of participants and prospects and the economic, political, cultural and ecological contexts of designing. For example, Appadurai (2013) articulates the future as 'a cultural act'. Such views, supported by attention to philosophical underpinnings and to futures framing lexis, together communicatively shape the views and vocabularies and cultural articulations of designerly informed, multiple futures.

Identifying, devising, and expressing such dialogical routes to plural futures making through design is not an extension of a future neo-liberalism, as Andersson characterises much of the application of foresight and futures. It is a potentially dynamic and response-able anticipatory view of innovation and systems – as these

rhizomatic essays attempt to reveal – that an abductive *and* transductive endeavour and that, by multiplication, is itself a matter of 21st century Anticipatory Design Literacies in-the-making [Figure 8]. The words of the novelist and semiotician Umberto Eco come to mind:

> *If fictional worlds are so comfortable, why not try to read the actual world as if it were a work of fiction? Or, if fictional worlds are so small and deceptively comfortable, why not try to devise fictional worlds that are as complex, contradictory, and provocative as the actual one? (Eco, 1994: 117).*

◄ **Figure 8**
Travel to a place that exists here and now, only over there rather than here': the tagline for the Philosophical pill 'Heterotopia' in one of its initial iterations. Future Philosophical Pills workshop at Central Saint Martins, UAL, 6 March 2020. (Image Credit: James Bryant).

Design, imaginaries and futures

In the 21st century we are engaged methodologically, practically and mediationally with what Rosner (2018) refers to as 'critical fabulations'. These are ways in which we rewrite technoscientific narratives of the digital and computational systems through feminist perspectives and practices. Such a mod of counternarrative points to the deeply socially constructed 21st century nature of global, local, digital and distributed design, and the hybrids and new combinatorial practices, artifacts, services and systems they deploy and convey. Here our scientific imaginaries (Marcus, 1995) and socio-techno imaginaries (Jasanoff & Kim, 2015) are critically important, as they too are shaped by prevailing and motivated positions and forces, where investment, education and policy are entwined in configurations and exercises of power (see also Zuboff, 2019). The domain of Science Technology Studies (STS) (e.g. Latour, 1999, 2005; Haraway, 2008, 2013, 2016a) has done much to expose the relational assemblages of the technological and the cultural. This extends for example to how national projects, corporations and social imaginaries work together, for example in the case of South Korea (Kim & Ku, 2021).

For Jasanoff, (2015: 338):

> … *sociotechnical imaginaries are part of the repertoire of the constructivist and interpretive social sciences. They consistently direct our attention toward the practices of collective sense making and the tacit assumptions that allow collectives to hold together in understandable, sustainable, livable modes of being.*

In her view 'the socialtechnical imaginary … is a voyaging concept' (Jasanoff, 2015: 321) yet sociotechnical imaginaries 'get built into the hard edifices of matter and praxis. Once situated in the specifics of time, place, and social worlds, they still have power to move minds and actions at a distance; and, as constructs in part of human thought, they remain continually open-ended and subject to revision.' (Jasanoff, 2015: 323). She writes that there is potential for social imaginaries and science and technologies together shape alternate futures. In conclusion, Jasanoff (2015: 340) argues that 'Analyzing sociotechnical imaginaries emerges, then, as a form of intensely political narration, reminding both observers and observed that the seen reality is not the only one about which we can dream'. [→ SEE FEATURE 4 for an example of a student project form FUEL4DESIGN on technologically re-meeting our deceased].

Such a view is taken up for example by Withycombe Keeler et al. (2019) in 'Intervening through futures for sustainable presents: Scenarios, sustainability, and responsible research and innovation' in which they argue for ways futures may be taken up to act on the present to build sustainability that may endure by way of developing participatory scenarios that disrupt 'status quo imaginaries'. In *Media Futures* Ernst and & Schröter 2012 examine relations between media and futures and how our present imagines its technological futures. In a more specifically design view (Auger, 2013), such disruption and imaginary prospecting is the stuff of speculative design (Sterling, 2009) that asks for a suspension of disbelief in the posing of alternate fictive and counternarrative futures, drawn from and back into the present to which I now turn.

Two instances of speculative designing and learning resources

In the remainder of this section, I present and discuss speculative design as an emerging mode of specifically design-centred futuring and knowing, and illustrate it with two examples in the extension of the work of FUEL4DESIGN and the DESIGN FUTURES LEXICON. These examples include the role of scenarios and personas in design fictioning and work with stretching imaginaries to contexts of supposition and subjunctive twists in rethinking potentials and consequences indirectly, abductively and poetically. In this sense they are experiential and narratively framed design fictions that, as Ward (2021) entitles his chapter in the *speculative.edu* project collection, are about 'Practice of hope, a method of action'.

However, this action is about conjecture and thinking into alternate paths to framing scenarios as it matters that we do tough work with imaginaries and explore potentials and creative pathways in the face of design innovation and functionalism that

# PoliMi PhD project

GROUP: 4

YEAR: 2022

TEACHER: Manuela Celi

STUDENTS: Alessandro Pasquali, Danilo Grugni, Khanh Linh Nguyen, Lorenzo Gennari, Silong Luo, Wanying Zhao

TAGS: Relations. Memories. Senses. Time.

Acheron Interface

A mental aid product to help with the coping of loss by enabling users to see the deceased again using AI. The machine's input are the real-time memories provided by users, while the output is a realistic VR experience in the form of lucid dreams and sensorial experiences. The trance is facilitated by the amniotic liquid in the tank, while the AI is constantly learning and updating through the user's feedback.
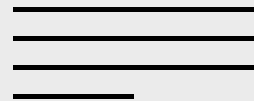
is reductive in not problematising and working with uncertainties. Elsewhere we pragmatically address contexts of real world needs concerning scenarios, water, social justice and collaborative governance [→ SEE **Essay 3: Time, Design and Futures Pedagogies**].

On speculative design

Lively experimental work and a considerable body of research has emerged in a little more than a decade in the area of Speculative Design. Growing out of the work of Dunne and Dunne and Daby (e.g. 2013) on critical design, design educators and design researchers have taken up that the much quoted Kirby (2010) refers to as diegetic prototypes. These refer to fictive objects that are fully functional in the environments in which they occur, such as science fiction film. Speculative design has come to be the umbrella term for intersections between media, narrative, design, technology and future imaginaries in which scenarios of a 'what-if' status are presented and invite engagement in reaching beyond the present to think through contexts and projected events in the near-, mid- and long-term future.

Interest in speculative inquiry has also grown in the past decade more broadly in the Social Sciences (e.g. Wilkie et al., 2017; Wilke, 2018; Wolf-Meyer, 2019) and has focused on speculation as a mode of inquiry. However, *design* perspectives have been concerned with acts of *design* making, as fabulation and for 'fictive thinking', not deception, as a means to working in designerly ways with futuring as material and means. These are oriented, as a stance, as an invitation, a provocation and a prompt, to engage students and publics in a diversity of ways of reaching beyond the present, into and through futuring, for returns to a troubled planet and, hopefully, motivated collective situated, current and long-term action to change our human responses behaviours and contributions to it (see also Kuijer, 2020).

What has become increasingly apparent in a diverse body of work in speculative design is its direction towards 'worlding' (Dunne & Raby, 2016; Coulton et al., 2017), whether in computer games environments or design fiction workshops as modes of involving participants in co-creative acts experiencing simulated scenarios for further thinking about change in the present, whether directly or tangentially. Design fiction, with affiliations to science fiction, cyberpunk narrative and aesthetics, feminist and queer futures (e,g, Evans, 2017), Afrofuturism (e.g. Anderson & Jones, 2016), and eco-futures, for example, offers a mode of serious play (Flanagan, 2010), of irony and pastiche, of anti-solutionism (Blythe et al., 2016) of upending expectations and using scenarios to highlight and problematise our present and projected values and assumptions and expectations.

While often dystopian, as a means to creating disharmony against an immediacy of ambivalence and disengagement, design fiction and its uses in education are frequently utopian in their diegetic prototyping as offerings of alternate futures and returns from their prospecting worlds and worlding. Counterfactuals are used in anticipatory worlding to problematise our conceptions back into the present, politically and communicatively, and where collaboration is central to its transformation (Light, 2021).

This points to how speculative design has stretched its early gallery and artifact assemblage propositional positionings and related critiques concerning gender and decolonisation (e.g. Prado de O. Martins, 2014;) towards looping scenarios, personas and events back into reconceiving alternative presents that acknowledge oppressive pasts and hidden histories of resistance and survival [→ SEE also Learning Futures Design Otherwise in Part III].

Speculative design is not simply the purview of comfortable critics, distant from real world needs and issues but that we need to engage with the conjectural and imaginary probelmatising as part of our wider and diverse material practices located in historical (Nooney & Brain, 2019), decolonising (Prado de O. Martins & Vieira de Oliveira, 2016) and matters of voice and representativity in shaping future imaginaries as resources for improved and different sustainable presents (see also Ilstedt & Wangel, 2014). Hoffman (2022: 5) writes that:

> By exploring what's possible, speculative futures cultivates critical thinking about the present and imagination of what lies ahead. The field embraces the fact that what we call 'the future' is a construct, an amalgamation of assumptions, interpretations, and inferences based on experience, research, and hope. Rather than presenting ideas of where the future can go as certainties, speculative futures works with those constructs, employing dynamic tools for prototyping, testing, and evaluating the ramifications of where our imaginations can lead.

In Anticipatory Design Literacies, not just foresight ones, our imaginary work is not just in the wind or in written and graphic discourse; it extends to sensory and affective modes of communication, where the haptic and kinetic are a key part of embodied knowing. Zou and Morrison (2022) elaborate on the role of the olfactory in 'sensing the future' through reference to Zou's doctoral experiments in developing quirky design fictive works through which thinking about and thinking with smell and changing contexts of critical responses to consumerism and cosmetics might be reconsidered in relation to wider ecological and environmental matters and awareness and anticipatory 'Anthropocenic' awareness (see Celi, & Colombi, 2019). Such 'scentory futures' making and thinking revealed a surprising dearth of work in this field in design educational and research settings and reminds us that doctoral futures based practice-based and speculative inquiry also has a role to expose possible and under-explored spaces and topics for further speculation and analysis. Zou (2023) also points to ways speculative inquiries can provide alternative heuristic stimulus and substance to inform and challenge existing science and technology programmes as STEM education also works to shape its situated, societally relevant futures.

In essence this is about bringing different knowledge and making practice into dialogue where the role of the speculative is to pose and problematise, suggest and surmise, not declare and define, secure and solve. It is part of a range and diversity of design material practices where design imaginaries are also part of our critical-creative means to finding was to contribute differently, than through expository discourses, in altering alter our present world and its current trajectories.

FUEL4DESIGN was fortunate to overlap with the related project called *speculative.edu* under the ERASMUS+ Strategic Partnership Programme. The project's website and cumulative book publication provide many details and nuances about reconsidering the workings and implications of speculation in design making and inquiry and research. Concerning design education, Auger et al. (2021: 209) observe that:

> *As a pedagogical tool, speculative design- at its best – opens students' minds to brave new worlds: to critical and creative interventions, transgressions and change, as well as the possibility of applying design principles and tools in very different contexts and types of projects. The speculative approach allows students to create sets of tools and a language for understanding the consequences of their design practice. It is particularly stimulating as an educational tool because it foregrounds criticism, self-reflection, and a move away from familiar practices.*

As FUEL4DESIGN has explored and these design fictive imaginaries offer, speculative design education seeks to engage 'learners as experts on their own futures' (O'Brien & Forbes, 2021). Such motivation was central to a part of the DESIGN FUTURES LEXICON called Renders that sought to reach beyond the work we had done and into alternatives and options for its application. Part of this work was carried out in conjunction Bastien Kerspern with our web and design partner and his role via the French design and games design bureau Design Friction/Casus Ludi.

More than human and adverserial in 'languaging' futures

The DESIGN FUTURES LEXICON was built on principles of multilingual, multimodal languaging that acknowledged the importance of language in a diversity of modes, as we short show in design friction collaboration concerning futures, language and movement and a multi-species perspective that acknowledges human/non-human symbiosis (Harraway, 2017). We chose to include a section we termed RENDERS to provide some examples of how the resources, tools and examples might be taken up. These were a mic of prospective, suggestive aspects, such as prosing ways of working with the futures of the LEXICON as well as access to an elaborated project-level collaboration with a practice-based art and design project with a partner university.

In developing 'Designing the futures of the Design Futures Lexicon' as a contribution to FUEL4DESIGN, Bastien Kerspern drew on considerable practice and research experience in working with design fiction. This ranges from government departments, municipalities, secondary schools and a design university in France. In developing this specific render Bastien drew on traditions of adversarial design (Di Salvo, 2012) amongst others, as well as his experience and collaboration in-house in devising a diversity of workshops on design fiction as ways to tackle the difficult task of focusing on the importance of shaping social imaginaries in playful, surprising and critical ways outside the more seemingly seamless approaches of many service deliveries offering smooth customer satisfaction. We welcomed such playful and inquisitive engagement in this contribution [→ SEE **FEATURE 5**].

Designing the future of the Design Futures Lexicon

BY Bastien Kerspern,
Design Friction and Casus Ludi

As futures are necessarily plural, 'Designing the futures of the Design Futures Lexicon' doubles up as a tool to (re)open imaginaries. This participatory part of RENDERS offers to replay or counterplay the two speculative scenarios with a playful Futures Branch-casting activity. For each scenario, one is first invited to imagine how the future depicted in the 'More-than-human Lexicon' or 'Adversarial Lexicon' scenario has happened. Then, in a creative twist, it will be time to design a counterfactual version of the original scenario and imagine an alternative future for the DESIGN FUTURES LEXICON. Link ↗.

DESIGNING THE FUTURES OF DESIGN FUTURES LEXICON
FUTURES BRANCH-CASTING KIT
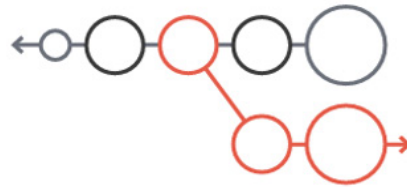
Future Branch-casting is a playful retro-speculaction exercise.

It is based on the concepts of back-casting from strategic foresight and branching narrative from speculative fiction. It builds on the notions of future visions and uchronia, a form of alternate history fiction. This tool invites you to dive into the scenarios of the Lexicon futures and rewrite them. With this horizon in mind, you are invited to imagine what lead each scenario to happen and how this future could have evolved differently.

The Futures Branch-casting a

Part 1. Back-casting:
You are invited to dive into or
scenarios and imagine the ke
To do so, you will have to fill i
speculations and imaginaries

Part 2. Uchronian branching
After having mapped the key o
future, you have to decide to o
previously defined. Then, ima
impact the initial future and tl
through an alternative timelin
future.

Futures Branch-casting offer:
- **Guided mode**: a format to st
timeline, with suggestions of
- **Open mode**: a blank timeline

To help you in speculating an
Lexicon, you are invited to us
Design Futures Literacies res

SCENARIO: THE DESIGN MORE-THAN-HUMAN FUTURES LEXICON

In a few years or decades from now...

The Design Futures Lexicon has evolved to help in designing more-than-human futures. The Design Futures Lexicon has become a hybrid collection of elements of "language" from humans, animals and plants. The Design Futures Lexicon articulates these "terms" as a way to mitigate the design of anthropo-centred futures, to integrate the "voices" of other species in the experience of building visions, as an act of mediation of non-human perspectives.

This new Lexicon merge pieces of human and non-human for communications or interactions between members of a same species members, members of other species, and the environment. It goes beyond words and definitions to help in sharing non-human perceptions of the world and its making, with sounds, simulation, smells, videos.

While constantly struggling with its own anthropomorphism, the Design More-Than-Human Futures Lexicon emphasises on terms for interconnections and interdepencies between humans and non-humans in the global ecosystem, as well as in space and time.

BRANCH-CASTING RESOURCES FOR THIS SCENARIO:
Design fiction, the webpage of the Lexicon
Guided mode timeline template
Open mode timeline template
Branching timeline template

(partial text, left column, cut off at page edge)

activity is divided in two parts:

e of the two design fiction
y steps that led to this horizon.
n a timeline by playing with

steps leading to the given
change one of the events they
gine how this change might
hen tell the new scenario
e and scenario showing a new

s two modes:
art smoothly, with a pre-filled
events and dates.
e, to unleash your imagination!

d imagining the futures of the
e the existing Lexicon and other
ources from FUEL4Design.

This work also indicated how the project's partnering with a design professional bureau can work, and how experience and engagement may be built between university design futures initiatives and practices in engaging a diversity of potential stakeholders in speculative design for their own futuring, not simply for advancing these interest of corporations. This example is a heuristic, a suggestion and a prompt. It provides students with options not directives: may be read and use, consider and move on, transpose into one's own work, etc. It suggests that learning resources for shaping shared survivable and sustainable long-term futures may be materialised in many ways and scales. It offers exemplars, less a traditional scaffolding, for arriving at specific learning outcomes but positions speculative pedagogies through designing as indirect, paralogical and prospective in their reflexivity.

Rather than leading students towards the all-to-often fallback of 'solutioneering', to converge, claim and solve, such a RENDER might lead students to look up additional resources on posthumanism and design, and in terms of the LEXICON the related *Posthuman Glossary* (Braidotti & Hlavajova, 2018) and what this might imply for their descriptive and analytical vocabularies and by extension their positioning via engaging the FUTURES PHILOSPHICAL PILLS.

Design fictioning, movement and 'tentacular thinking'

In keeping with the widespread role of collaboration in design and design pedagogies (Maxwell Lane & Tegtmeyer, 2020), and as part of a cross project collaboration between FUEL4DESIGN and *Amphibious Trilogies* Link ↗, we examined choreography in an extended public space, we devised the design fictive persona Octopa. Drawing on earlier work on personas, futures, climate and sustainability (Morrison, et al., 2013; Morrison, 2018; Morrison & Chisin, 2017), we developed a range of activities around the non-human, ventriloquised figure of the multisensory, poly-kinetic and intelligent octopus, including movement, arctic travels on land and sea, online tools and workshops, project mediation and research papers. In a sense, we were doing what Candy (2018) positions as 'gaming futures literacy'. Here we accessed relational work into the experimental uses of speculative fictioning [FEATURES 6) in design disciplines (Knutz, et al., 2013), drawing on writing studies and online rhetoric and visual and spatial aspects of the generation of 'new mythologies' and anticipatory landscapes (Ilysin, 2019; House, 2016; Morrison, 2019).

Our focus on collaborating between choreography, design, media, gaming and communication, including CASUS LUDI mentioned above, was to connect the language focus of the LEXICON with the kinetic, choreographic shift of 'movement as design' out into the world, that is off the traditional performance stage. With Amanda Steggell, we coordinated the making of such a design fictive kinetic character OCTOPA and the environments through which they shifted and moved, extending this to workshop specifically on working with movement words and futuring in choreography. Together we redirected this back into the LEXICON and a range of design master's and PhD classes and schools in Norway, in the Nordic region and the U.K. [→ SEE FEATURES 7 and 8 for details.

In the final chapter of Volume 1 we take up action and speculation in the context of the elaboration of work with OCTOPA in the form of new workshop resources and experimental spatial work shop sessions. This more recent work sought to connect the speculative to disciplinary contexts of interest, need, learning and research and to engage participants in working spatially and in a dialogical mode of their own journeys with OCTOPA. This takes place in the climate challenged and geopolitically delicate context of the Northern Sea Route. It looks into ways the fictive and counterfactual may be put to contemporary critical use to open out additional layers of placing 'tentacular thinking' (e.g. Haraway, 2016b) into shaping present experience and negotiations around power, place, identity, representativity and change (see Morrison et al., 2021).

Matters of identity and representation - in a non-representational mode (Vannini, 2015) in our work on an extended design futures choreography - are central to how design futures and design fiction are articulated in contexts of decolonising design. In 'Dreaming outside the boxes that hold me in', Noel (2022) contributes to a special issue of the *Journal of Futures Studies* on race, identity, social justice and futures. In referring to three case studies based on lived experience, Noel takes up Critical Utopian Action Research as a way to connect participants to matters and solutions that interest them so as to support motivated and creatively critical change. She writes that:

> *This methodology is useful because it gives oppressed people space to dream where they might otherwise not have been able to, e.g. because they were focused on the day, because they have to hustle, or because they have to battle with other people's impression of them. In this methodology, they have space to be critical of their circumstances. However, the methodology does not stop there. In Critical Utopian Action Research, participants have the opportunity to dream of the desired state and to create action to get there. (Noel, 2022: 11).*

Such moves to action through speculative design also have for some time been taken up in HCI research and teaching and this is the focus of a recent guest edited issue of *Interaction Design and Architecture(s)*. While contributions are largely located within computer science education and its crossovers into interaction design outside of academic university settings, a number of key thematics indicate that critical and speculative design has pursued within higher education and learning futures. Kuijer and Robbins (2022) argue that through critical design we are able to teach alternative paradigms, where there is room for the provocative in our pedagogies (Pérez-Orrego, et al., 2022) especially when we are looking critically and carefully at intersections between people, things and future technology relations (Culén & Stevens, 2022).

In the Essay 3: Sustainability, Systems & Learning Design Futures we continue to frame, discuss and position an Anticipatory Design Literacies with reference to Sustainability for Design (SfD) and Systems Oriented Design (S.O.D.). Both domains have been apparent in the work of our project, but neither have been interlinked much with anticipatory design literacies and we suggest some issues and possible directions in support of that. Our interest is in featuring *cultural* perspectives on designing and learning with futures in design education concerning sustainability and systems.
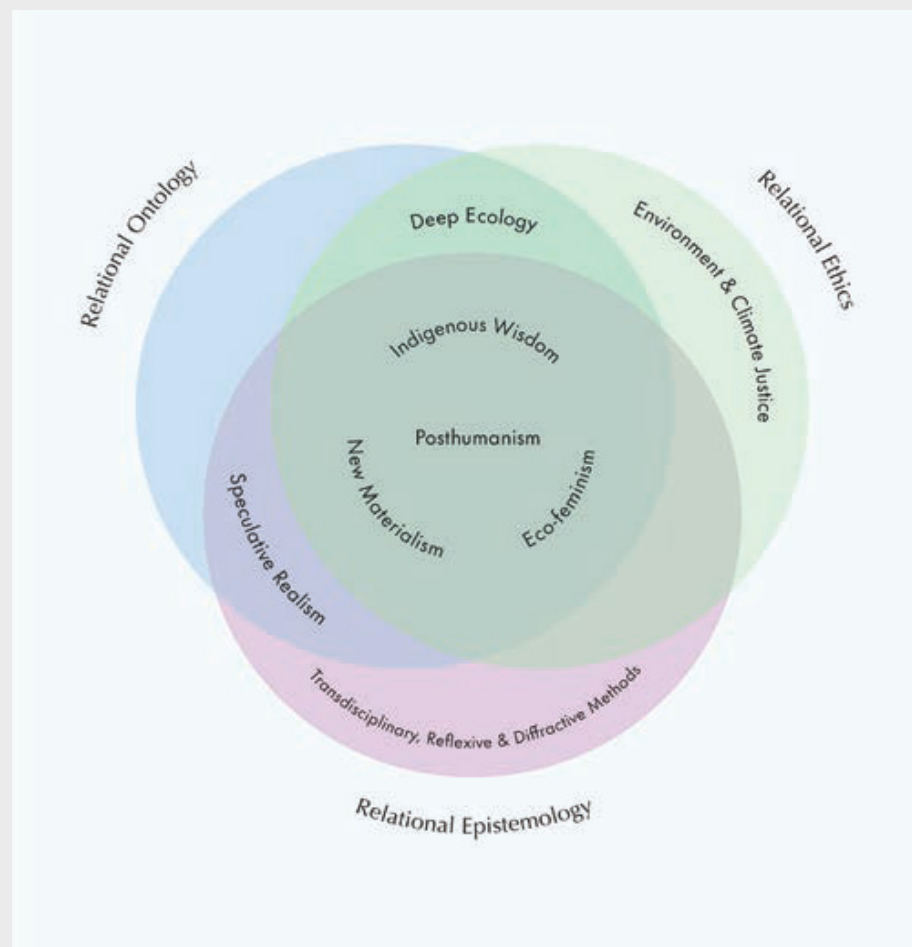
Relational charting, domain areas and transdisciplinarity

EXCERPT FROM:

Zou, Y. (2023). *Speculating on Design, Life Styles and Forms. Studies in the contexts of climate change and sustainability.* PhD thesis. Oslo: AHO. **Link ↗**.

SUPERVISORS: Prof Andrew Morrison & Prof Håkan Edeholt (AHO)

▲ **Figure 1.** Relationship between different theories studies and relational thinking, (Zou, 2023: 74).

Slippery Scales and Relational Ontologies

'Being amphibious and working amphibiously through a mix of art, design, humanities and social science (see e.g. Nilsson, 2009), allows engagement with the role of irony, the pose of personas, the potential of the fictive, while working with contexts of the actual and societal and the futural and speculative. In our work we have adopted the notion of amphibiousness, an elusive, queer theory oriented, and excessive Baroque-like scalar terms. It has allowed us to shift and dip and to change character and qualities in motion. The notion allows one to move between, within and across domains of knowledge, environment and reflections. These entail the kinetic in context, in the now, through its legacies and into futures. The slipperiness of amphibiousness also refers to being tricky, even deceptive and playful between states, ideas, movement and reflection.' (Morrison et al., 2021: 172)

'Our response was to venture into 'Building a poetics of design fiction' (Markussen & Knutz, 2013) in the wider context of 'being ecological' (Morton, 2018) in an ecosphere in which design, ecology and politics are entwined via design. This entwining would be shaped through a transdisciplinary co-design mode of connecting movement, narrative scenarios, critical play, and the facilitation of 'anticipation-oriented thinking' (Kerspern 2019). Kerspern has conceptualised this as a slippery interweaving of game design and design fiction to produce 3 hybrids: 1) playing (with futures, 2) replaying futures, and 3) counterplaying futures. In addressing the range of issues, possible, likely and conjectural survivable futures and the NSR, we would need to engage people in a design fiction that would both play with and play the future through limited options (Coulton et al. 2016). However, those given and contemporary projected futures, from utopian to supremacist, linear to dystopian, would need to be repositioned to facilitate a mode of 'replaying futures'. As transductive method and multimodal digital rhetoric, we used irony as a key mode of address and 'hook'.' (Morrison et al., 2021: 177).

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Markussen, T. & Knutz, E. (2013). 'The poetics of design fiction'. In *Proceedings of DPPI 2013*. New York,: ACM. 231-240.

Morton, T. (2018). *Being Ecological*. Cambridge: The MIT Press.

Nilsson, P. (2009). *The Amphibian Stand*. Umeå: H:ström-Text & Kultur.

Design Literacies, Creative Writing and Research Futures

BY Andrew Morrison

BLOG POST: 19.11.2020. **Link** ↗.

Design literacies, creative writing and research futures

Part of the work in the LEXICON (**Link** ↗) has been carried out in a three-way collaboration between AHO, our project designer Bastien Kerspern of Design Friction (**Link** ↗) design studio in France and Prof Amanda Steggell of KHiO, the Oslo National Academy of the Arts In Oslo. This work was centred on connecting the futures-facing terms and contexts of the LEXICON to matters and contexts of movement in our joint membership in Amphibious Trilogies (**Link** ↗), a project that is led by Amanda, based at KHiO, under the National Artistic Research Programme (NARP) in Norway.

In this partnership, one interest has been on developing inputs and uses of futures words and settings and dynamics in which they may be seen as relating to movement as shown in the LEXICON UNIT 2.6 FUTURES DESIGN AND MOVEMENT (**Link** ↗) and the related FUTURES DESIGN MOVEMENT WORDS (**Link** ↗).

A second interest has been to delve into ways in which futures design literacies

may be elaborated and situated critically in terms of the context and environments in which they are cast, crafted and communicated. This is central to how the LEXICON relates to the intentions and activities of the project's FUTURE PHILOSOPHICAL PILLS (**Link** ↗).

A third interest, and that covered more fully here, has been to explore ways futures design and language may be linked with the design fiction, scenarios, personas and movement.


▲ A gif of the OCTOPA interactive tool.

This has principally been realised through our design fiction persona OCTOPA (Link ↗) and her travels in relation to the Northern Sea Route. Our design fiction device OCTOPA's JOURNEY (Link ↗) provides a satirical gameplay for users.

The LEXICON addresses design futures literacies for master's and doctoral students in design. In this regard I was invited by Prof Ingrid Halland at the Institute of Design at AHO. Prof. Halland works specifically to support AHO's PhD Programme, to contribute a lecture on research and creative writing to a PhD class joined with an elective for master's students as part of a lecture series entitled ´Objects of Research'.

In making a presentation and inviting discussion on OCTOPA's JOURNEY in particular, I was fortunate to follow the very carefully positioned work by Anne Kockelkorn, co-director of the Master of Advanced Studies in
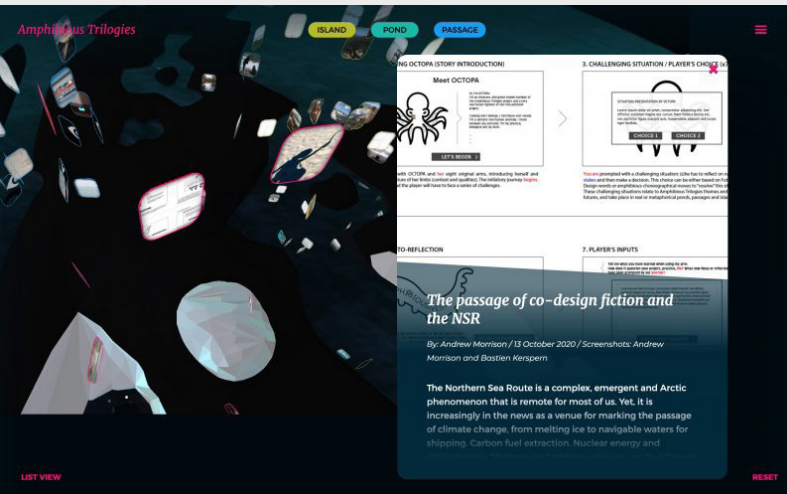
▲ Screenshot of blog post on **The passage of co-design fiction and the NSR ↗** from the Amphibious Trilogies website.

History and Theory of Architecture, ETH Zurich. In my talk I led the class to a section About the Northern Sea Route (Link ↗), and also The passage of co-design fiction and the NSR (Link ↗). I tried to elaborate on relationships and motivations for inquiring into, making and sharing through an interplay of matters of scenarios, satire and
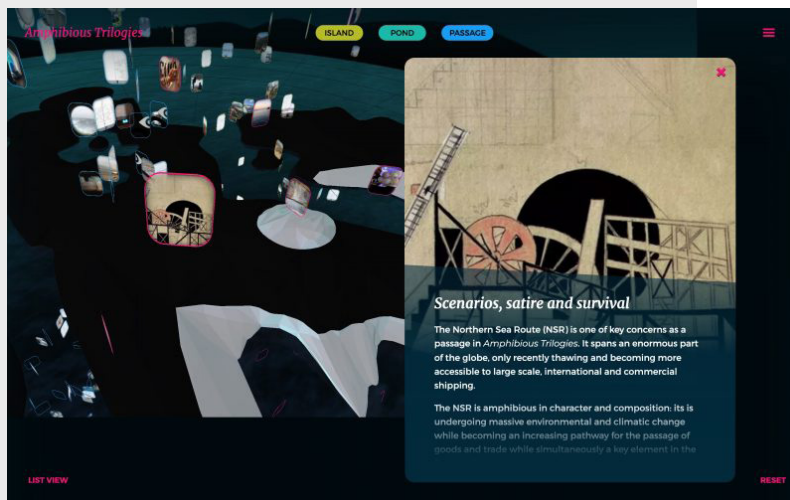
▲ Screenshot of blog post titled **Scenarios, satire and survival ↗** from the Amphibious Trilogies website.

survival. That last post noted that:

With OCTOPA and the 28 scenarios we co-devised, we wanted to escape ghosts and monstrous sea creatures. Instead, the being of a multi-brained, many armed and shape-shifting character would demand of us similar tenacity, regenerative acts, distributed and connected thinking and an ability to move amphibiously, literally and physically.

One is increasingly asked for independent feedback on educational interventions and pedagogies, so I offer this extract from a mail from Ingrid that was referring to the projects' material more broadly on design fiction, OCTOPA and the cross over between FUEL4DESIGN and *Amphibious Trilogies*:

Andrew, your post was absolutely amazing! You went through so many of the aspects and dilemmas that we will discuss throughout the semester. Everyone in the room continued to talk 20 minutes after you logged out of Zoom, because the discussion was so exciting. I'm glad to hear you're working in a pretty radical way. I especially liked your comment 'all research is fiction'.

I had said this wryly, in the spirit of working with pastiche, satire and a gameplay 'logic' to propose, promote, provoke and project questions through design fiction. I also alluded to the ways in which research is always rhetorical, in its persuasive and argumentative forms and means as well as in its processes of making and remaking.

In times of institutional, presidential and ideological fake news, and strategising – whether in geopolitics or in terms of race and the decolonising of media, design, language and literacies – this needed saying so. This was because the regenerative, reflexive, critical and pragmatist gendered characteristics, dynamic and knowledge devising OCTOPA allows would not be misread. It was also a point to address where some critics of design fiction parse its purposes too literally as not able to solve functionalist needs. Conversely, as almost baroque like device, exceeding her physical form. OCTOPA challenges us to think and to connect and to distinguish words and movement in complex contexts of change that need our design futures imaginary literacies motivation and articulations.

Design fiction in our experience does have a productive communicative and conceptual place in the languaging and imaging, play and movement involved in negotiating the complexities and framing of the Northern Sea Route. That is a passage in itself that is a cipher for the mental and culturally changing constructs we encounter in design futures literacies, climate change and the Anthropocene.
As was noted by one of the PhD students to the session, this is as much a material, melting and increasingly kinetic passage of terms and views needing to be addressed in acts of decolonising design and prospecting design futures in and as design futures literacies.
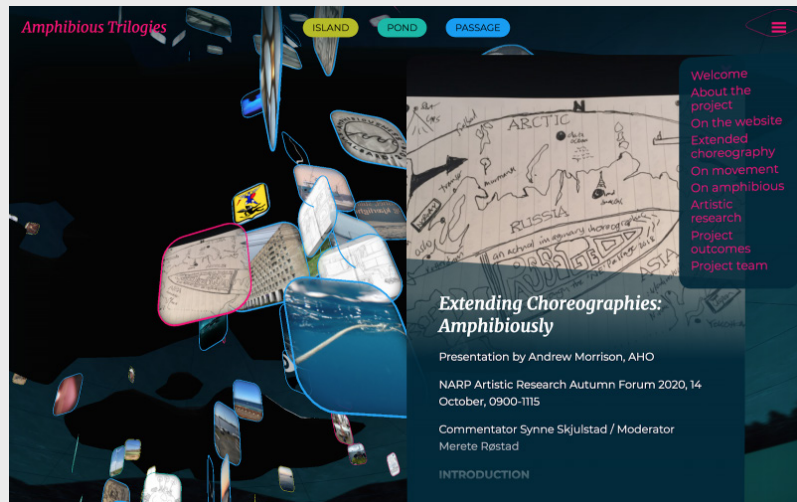
▲ A screenshot of the blog post titled **Extending Choreographies Amphibiously** ↗, from the Amphibious Trilogies website, summarising the presentation made at the NARP Artistic Research Autumn Forum 2020.

This I took up in a LEXICON and FUEL4DESIGN contribution to a final research presentation to the NARP Artistic Research Autumn Forum 2020 on behalf of Amphibious Trilogies. The presentation drew on my extended links to the project through the LEXICON and to the role design fiction may be seen to have in working with futures vocabularies, narrative and creative and critical expression and articulation. An outline of my talk entitled Extending Choreographies Amphibiously (Link ↗) may be followed through a set of slides.

Interestingly, these slides were auto generated by WordPress by way of a set of links assembled from the project website as part of the personal-computational in design futures literacies. They were a reminder of the computational a lexicographic experience I'd had earlier in my career as an applied linguist, discourse analyst, media and education teacher and researcher.

5.
BETWEEN DISPOSITIONS
AND POSITIONS

BY Andrew Morrison & Manuela Celi

Towards anticipatory design futures

In the design anticipatory relational approach sketched out here, the signs, tools and practices of representation are inseparably entangled with the other semiotic-material actors that make up their assemblages and networks. In this way, they do not only participate directly in the differentiation, or individuation, of the phenomena and things to which they are directed. They also are themselves determined by the relational processes involved. In an anticipatory design view, this is may be achieved through shaping relations that are plural in character, that is through process philosophical and multimodal discursive formations and processes. As de Smet and Janssens (2016) formulate it, we are engaging in 'probing the future by anticipative design acts'. In a sense this is to engage in a shift from dispositions, that is a quality, waiting and leaning toward a mode of acting or interest, towards arriving at positionalities through venturing that support acts and processes of becoming and of change. The latter is evident in the LEXICON devices and diverse uses as well s via the applications of the FUTURES PHILOSOPHICAL PILLS and the student projects emerging within the DESIGN FUTURES SCOUTING.

However, processes that are pluriversal in terms of knowledge frames and cosmologies are themselves articulated through a diversity of languages and potentially for futures design pedagogies and inquiries via translingual conceptualisation. This too is patterned, pictured, voiced and communicated via a diversity of analogue and digital means and platforms. Yet, these are devices of our own making along with the fermentation of increasingly machinic construction. Together, such mediational pluriversal discourses, and the relational designs that envision and convey them, are ones that entail inbuilt and emergent potentials and practices, alongside embedded constraints and assumptions.

Clearly, the anticipatory ontological character, status and mediations of pluriversal design futures - framings, processes, practices and articulations - offer intricate relations and materials for design pedagogies. As students and educators, design practitioners and researchers we need to be sensitive to their diversity, difference, affordances and affect. To do this we need to engage actively and critically with their realisations in the work of designing and all that it may entail. Anticipatory design futuring thus needs to draw forth the designerly strengths of our existing practices and traditions, such as from Participatory Design and Social Design. However, these

approaches and legacies need to be placed in dialogue with a stance of 'taking care ahead of time', where design views on care and time are also in needs of elaboration, as we take up below.

All in all, from our modest and shared experience, this leads us to see such anticipatory design and its pedagogical social discursive materialisations in terms of critical perspectives of relations between design, technology and ecology. Too often techno-determinist takes on technology have corralled us into herd mentalities and towards socio-technical imaginaries that are weak on contexts, thin on culture and precarious in terms of participatory politics. Where socio-technical imaginaries are central to design, in an anticipatory design and pedagogical frame, our notions of why, when and by whom such imaginaries are formulated and floated also needs critical reconsideration.

Futures making and changing relations in literacies and pedagogies

As educators, designers and researchers caring for and facilitating futures literacies in design, it is in our interests as design educators and researchers, collaborators and strategists to bring these modes of anticipating into relation to one another. For us, in positioning design as a core mode of anticipation, there is need to further elaborate anticipation as change making, and change making by design. In what ways might anticipatory design and designing be connected to design pedagogies and master's and doctoral level students?

A master's education is in essence a preparation for operating in professional work settings. Yet these are changing as relations between materials, supply chains, consumerism and consumption are being revised and changed in the context of climate and human effects on the planet. Design futures pedagogies therefore need to draw on futures literacies developments but to twist and turn them into design-centred critical construction while motivating students and their guest teachers from design bureaus and research projects to engage in change-making practices, such as around degrowth, circular economy and materials re-use.

Added to this is a needed shift away from our human centredness to a posthumanist ethos in which humans and non-humans are appreciated and understood to act in non-binary relations. Writing in design is emerging in this area such as by Laura Forlano (2017) on our Advisory Board, a collaborator and contributor to the project Ron Wakarry (2020) and from Yue Zou, one of our project-related PhDs (Zou & Morrison, 2022).

Doctoral design students need to draw on these dynamics in contexts where they are learning to carry out research. Equally, how research may be modified and resituated to support and explore changing modes of making, use and recirculation in frames of sustainable long-term futures. This in turn demands re-negotiating and asserting alternate views and practices, as well as analyses that are part of building responsible and resilient recognition of fundamental changes to fossil fuel-driven economies.

It forces us to think, choose, make and act in an environmentally and humanely durative behaviour that acknowledges but reject the undeniable denuding of ecosystems and our human capacities that simply block change for shared survival - and flourishing.

On criticality and performativity

We see design education as central to wider collaborative societal and planetary futures. In these wider futures, design futures literacies are ones that elaborate on futures literacies. Design futures literacies work to connect purposes, forms and practices of reflexive design education realised through continual, critical and anticipatory 'becoming-in-the-making'. (Morrison et al., 2020).

Anticipatory designing is about the temporal: it needs to include up a plurality of times and futures, materials and methods, participants and expertise [→ SEE Essay 4: Time, Design & Anticipatory Learning]. Long-term futures - perhaps the hardest to think through as ones to which we are committing ourselves as well as people and things that follow us - in one way or another has to be shaped in the here-and-now. If we do not engage critically and creatively in the small space in the near future, longer-term futures will indeed be dystopian ones. Either way, we will be languaging those futures and they will impact on how we use and develop terms and connect and explore them in regard to the world views they might convey and through which they might be oriented further.

So, hope, aspirations and visions of improved futures, once so treasured by industrialised design, resurface but now with the weave of services and interactions, systems and relations that are distributed, global and local, personal and generic. Educationally, this is not merely a matter of shaping options and positive potentials of our human capacity to project into the future in using language to voice those design shaped futures. It is also about our being capable of critically considering consequences of anticipatory design actions in what they position and how they are re-framed, that is like and through our performative articulations of lexical and discursive ontological design futures.

As we follow though in the last two linked essays, this also needs to be crafted and assessed, re-shaped and revised in concert with other aspects and methods of designing futures literacies. This is itself a relational dynamic composed in-the-making and transforming itself in process and situated uses in design learning, pedagogy and inquiry. In doing so, we are all as part of learning futures design, not just learning about the future as literacy. We are also embedded in realising design for futures learning where futures are part of materials and mediated relations between human and non-human, environment and experience, histories and the emergent.

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ALTERING PROSPECTIVE DESIGN PEDAGOGIES

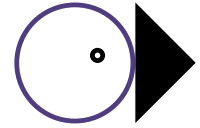**BY** Andrew Morrison, Silke Lange & Betti Marenko

WITH Pras Gunasekera, Palak Dudani, Manuela Celi & Oscar Tomico

1.
FACING URGENT CHANGE HEAD ON

BY Andrew Morrison & Silke Lange

Introduction

Our project began in 2019 with the best intentions to work with design teachers and researchers and a diversity of design students at master's and doctoral levels and together chart pathways and build experience in shaping design futures literacies. As a team we had envisaged the project being closely connected to practices of making, teaching, learning and researching. These were ones deeply embedded in our studios, labs, pop-up spaces, lecture halls, collaborative work areas and in partnerships with companies and communities on site and in the field.

Taking up design futures literacies as a core theme in the project was both inspiring and daunting. Educationally, as a team working on our funding proposal to the ERASMUS+ Strategic Partnership Programme we saw many shared interests and needs about better connecting and supporting designing and learning and their relations to researching. In the UK, such connections often fall under the remit of 'Knowledge Exchange,' working at the intersections of pedagogy, practice, and research. Within art and design education, knowledge exchange activities are collaborative, creative endeavours that translate knowledge and research into impact in society and the economy. It includes a set of activities, processes, and skills that enable close collaboration between universities and partner organisations to develop commercial, environmental, cultural and place-based benefits, opportunities for students and increased prosperity (KE concordat 2020).

With a focus on futures and design education, we hoped to stretch ourselves as a group and in our own settings and to offer spaces and emergent and experimental practices for a variety of activities and opportunities in which students might engage. Such engagement might be central to existing courses or contribute to a part of them. They needed to be seen as part of a wider systems and organisational view on design education, centred on key issues of climate and sustainability, equity and social justice (e.g. Capper, 2018). Yet, our own engagement in developing approaches and learning resources for Design Futures Literacies would also likely take place in informal, emergent and unscripted ways as teachers and learners would hopefully leave the presented materials and offerings and chart paths and territories and responses and articulations of their own.

◄ **Figure 1**
Postgraduate students from across UAL engaged in sense-making activity in one of Central Saint Martins distinctive suspended glass spaces, above an empty classroom presaging the effects of the pandemic soon to follow. The 'Hacking Futures - Futures Hacking' Philosophical Pills workshop at Central Saint Martins, UAL, 7 February 2020. (Image Credit: James Bryant).

Critical creativity and the lure of the future

Curiosity with criticality would be central in all these ventures, formal and informal. Acknowledging histories and potential of remote tomorrows and their impact and influence on shaping action in alternate presents would need close care and openness to the unexpected, and to unfolding difficulties and processes of negotiation. With futures as a key concern, the project would need to also look sceptically at the lure of the future, to disambiguate false prophecies of the new, of techno-determinism and marketisation of creative economies and generation of neoliberal higher education systems.

All of this was highly motivating and posed considerable challenges in the real actions of shaping design pedagogies in relation to futures. With the arrival of the Covid-19 Global Pandemic, they became suddenly far more acute and implicated in known, emergent, and unknown ways in our changing everyday lives and work as design educators (Williamson et al. 2020). The pandemic separated physical contact and immersed us in online learning activities that needed rapid responses and ongoing preparations, delivery, engagement and responsiveness to the now new and changing needs of students (see e.g. Giroux, 2022); [→ SEE **FEATURE 1**]. We would need to engage in quick, supportive and developmental building of open and shared online design learning resources (c.f. Collina, et al., 2017) about futures in and as crisis within an emerging and challenging global crisis [Figure 1]. With our intentions to work in a broadly

transformative mode of education following Freire's Pedagogy of the Oppressed, we would need to work to counter a Pedagogy of the Depressed (Schaberg, 2022) taking over in times of pressure and renegotiation in compacted, overlapping and magnified crises.

In this second essay, we reflect on our shared and distinct responses to the unfolding character of the global pandemic and in a pivot of the physical and digital aspects of our teaching and learning spaces and practices to new socio-material practices in which digital, 'remote', asynchronous and online learning took shape. These responses were acute, in terms of the sheer societal duress of a massive experience and educationally of needed support, technically and pedagogically. In all of this, such changes and adaptions may be understood as an action mode of 'reassembling the literacy event' as its being and including attention to human and non-human actors (Lenters, 2015).

In our pedagogies during the shift to digitally mediated learning and communication, it's become increasingly clear that we need to critically assess how we have been shaped by platforms and tools at a technological but also a mediated communication level. How we work actively within such realms of constraint and difference from our previously predominant face-to-face pedagogies, ones infused with digital designing, also needs to be reconsidered and potentially unpacked pedagogically and strategically. It has potential as a distributed resource from which to re-future our pedagogies by designing them with distance and distinction from what was to what 'might better be'.

'Literacy-as-event'

In the chapter Design Education Reconsidered, we pointed to literacy as having shifted its focus and scope. This concerns changes in the framing and enactment of literacies from procedural skills to matters of a social practice, to multi-literacies, digital literacies (Buckingham, 2006), futures literacies (Häggström & Schmidt, 2021) and learner produced content and situated design expressions. This has also extended to posthumanism and literacy education (Kuby et al., 2019) with underlying pedagogical relations between the ethical, ontological and espistemological within the constructs and operations of neoliberal university settings and structures (Kuby & Christ, 2018). The latter points to how design too needs to be critically counter-positioned regarding its infrastructural, systemic and organisational logics if we are to be able to work to more fully advance meaningful and transformational design futures learning for long-term survival. Pedan (20121) reminds us that there are still gaps in knowing how to facilitate and implement co-creation in reconfiguring design curricula processes. Process learning approaches also need to be considered in shaping design futures literacies (Peterson, 2020) and be considered in intertwining competencies and courses for 21st-century designers (Weil & Mayfield, 2020), including DIY, maker movements and open design principles in exploring design learning dynamics (Collina et al., 2017).

Here the notion of 'literacy-as-event' from the learning sciences is apposite for design and ways FUEL4DESIGN has conceptualised, developed and facilitated 'learning encounters' and re-configured them in times of incredible pressure and need. As

First Person Perspective Student Project

BY ELISAVA

TITLE: IO3 DESIGN FUTURES SCOUTING

AVAILABLE: Link ↗

First Person Perspective (1PP) design interventions to create alternative presents

When taking a 1PP approach to future scouting, the act of designing becomes personal. Designers design for themselves, and share their outcomes; or designs for their community from within. These ways of designing require continually reassessing relationships that arise between people, places and purpose, to better understand and respond to the complex interplay of needs and values in-situ.

As 1PP positions designers within communities, future scouting becomes a design intervention in context, the seed for the exploration of alternative presents. It situates and gives meaning to locally conducted design actions; accounts for individual and communal situated experience; and empowers diverse, often marginalised actors in bottom-up and top-down transformation processes, using materials at hand.

The first day of my new life   +

A personal challenge   +

Change yourself   −

This activity consists of actively transforming the participant's behaviour, identity, or any other traits of their personality and then going outside to see how people relate to them and see how they feel in relation to them.

Prompt: Change one aspect of your identity, behaviour or personality and go outside. Reflect on how people relate to you and how you feel in relation to their reactions.

Video: Clément Luc Rames, Master in Design for Emergent Futures, 20/21

Clément became what he hated the most, a tourist guide for a day in Barcelona. He walked around the city trying to give advice and support the few people visiting tourist attractions. Facing his "enemy" allowed him to better understand the personal side of tourism and the real people behind this word.

Figure 1: Clément Rames' First Person Perspective (1PP) design intervention as a tourist guide in Barcelona. Master's in Design for Emergent Futures (ELISAVA, IAAC).

◄ **Figure 2**
Participant students worked in groups to produce collages to vividly illustrate their visions of the future. The 'Hacking Futures - Futures Hacking' Philosophical Pills workshop at Central Saint Martins, UAL, 7 February 2020 (Image Credit: James Bryant).

Burnett and Merchant (2020a: 9) observe:

> *By thinking about literacy-as-event, we move towards the unique and unpredictable effects of social, material, and semiotic emergence that lie at the heart of meaning-making, gesturing towards its fluid and elusive nature, and turning our attention towards this sense of potentiality. This highlights what might be possible; it provides a way of sensing what else might get produced if things assembled in other ways; and hints at what is virtually there. It does this through an affective–reflective engagement with literate encounters. It may also help us better articulate and develop research methods that bring indeterminacy and affect into play, and that work with complexity rather than seeking to order it through linear accounts. Importantly, such work needs to be approached with an ethic of care that involves an ongoing review of what happens and what is generated as people and things come into relation. With all this in mind, we propose that engaging with literacy-as-event holds the promise of reinvigorating literacy studies' radical edge.*

As with all higher education teachers and students, our design located 'pandemic pedagogies' have been relationally entangled with the changing character and practices, tools and mediations of the ongoing negotiations of our literacies. These have depended on our prior expertise and adaptability as educators and our pedagogical, design and design research practices [Figure 2]. They made new demands on our students and on ourselves. They propelled us into shifts in daily and project planning and activity: involving time and space, digital tools and 'distanced dialogues' while seeking to provide facilitative support and constructive appraisals. They exposed our institutional, professional and sector assumptions and norms.

Learning together in flux

In the flux of our experiences in lockdown modes of trying to support the designerly in design education, we were challenged to rethink, to undo, and to re-learn our ways of working, teaching and learning and then to enact them: through learning encounters, from print and face-to-face modes [Figures 3-5], to largely digital domains. Gourlay et al. (2021: 382; original italics) propose that such 'lockdown practices can be seen as entanglement with various semiotic assemblages.'

Such assemblages are embodied, situational, performative, transmodal and interactional acts, processes and outcomes of situated meaning making (e.g. Morrison 2010; Pennycook, 2018). They may be understood as a form of boundary work (Gourlay et al., 2021: 381): volatile, emergent, blurred, new, redrawn and renegotiated. They are 'related to materiality, temporality, practices, emotions, routines, home and work, relationships, and communities'. However, they also demanded a rethinking and unlearning of our already framed and enacted digital design practices, as suggested more broadly by Burnett and Merchant (2020b).

For master's design students and teachers, and for PhDs learning to do design research, expectations and aspirations needed to be reviewed and revised, reconfigured and enacted differently in largely digital domains. Over the past two years, these re-riggings and re-jigging's have been more than setting up digital stages and ensuring presentations and performances are delivered. They have been about intensive and extensive and urgent changes in our practices as teachers and learners. This has involved our own agentive activity in negotiating changing boundaries but also changing pedagogies and learning dynamics (Morrison et al. 2019).

The concept 'learning encounters' dropped us into new routines and evolving patterns of working spatially, such as in Miro boards, and temporally through a new screen formalism in Zoom some may suggest. It is within these shifts to online, distributed design-based learning that F4D has needed to operate, innovate, respond, adapt, react, re-view and at times resist. No small task. There follow some modest proposals and offerings - and hopefully motivating ones.
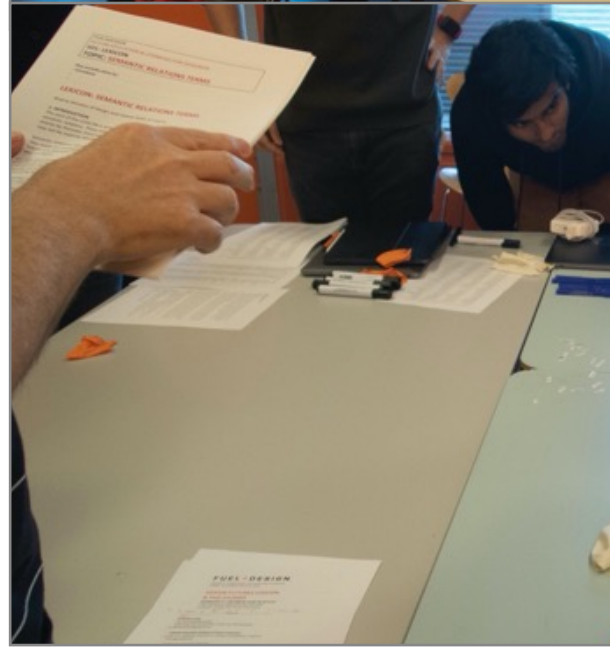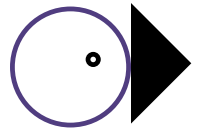
◄ **Figures 3 - 5**
Sequence of activities in the PhD BALLUSION workshop, AHO autumn 2019. (Image credit: Palak Dudani).

2. REFLECTING OUR PEDAGOGIES

BY Silke Lange & Betti Marenko

Learning to unlearn

The following text is an excerpt from I05 Orientation Unit. Learning to Unlearn and a presentation at E1 Dissemination Event Anticipatory Actions, 29 November 2021, 1400-1800 CET.

I05 Orientation Unit. Learning to Unlearn

We wish to offer some insights around the pedagogical ethos that informs the FUEL4DESIGN project, and which is found more explicitly consolidated in the Orientation Unit in I05. This unit was conceived as the foundation of our proposed Futures Literacies Methods journey to offer guidance to those engaged in teaching future design literacies. Its key purpose is to assist us, educators and facilitators, in the work of deconstructing our prior learning, while reflecting on, and continuously evaluating our teaching practice.

We envision this Unit as a space for the sharing and exchange of our own knowledge and experience with the group, so that we all can give and receive feedback through presentations, discussion, micro-teaching, peer observation in an atmosphere of mutual support and solidarity (**Link** ↗). A sustained practice of self-reflection is always needed for our teaching practice to resonate fully with the learning environment we operate in. Nevertheless, self-reflection becomes even more significant and necessary when our remit is to work as educators across design, futures and literacies.

This territory, with its multiple transdisciplinary intersections, demands of us that we position ourselves not as external representatives with 'content to deliver' but as co-agents fully implicated in the learning process, and acknowledging that this process is highly transformative for everyone involved.

Thus, the first pillar around which the Orientation Unit is built is the idea that for education to be engaged with future-making, thus genuinely transformative, our teaching practice cannot be disjointed from the work of positionality.

The Present of Future-making

Today's design education landscape (at least in the UK) is increasingly goal-oriented, metric-driven, and substantially shaped by the (perceived, speculative, constructed, fictional) rewards that 'the future' is expected to bring to the key stakeholders the learners (as

consumers). Such talks of 'the future', especially when framed through the narratives of employment opportunities and professional success, may have the detrimental effect of pre-empting learners' potential and of funnelling their energies and agency into what appears to be the most strategic and opportunistic directions. In this context, education risks being marred by a displacement manoeuvre that, in its focus on a fictional 'future', ends up neglecting the present, what is shared right now. Put differently, we ask: How do we keep hold of the present (this present) when we work on futures literacies?

One answer comes from activist and educator bell hooks, who in her book *Teaching Community. A Pedagogy of Hope* writes:

> *Teaching students to be fully present, enjoying the moment, the Now in the classroom without fearing that this places the future in jeopardy: that is essential mindfulness practice for a true teacher (Hooks, 2003, 173).* (**SEE Reference 1**)

What hooks prompts us to reflect upon is simple: not to lose track of what is unfolding in our present, in our everyday practice, right in front of our eyes, and remind ourselves to see transformation as a trajectory that may be slow, imperceptible, irregular, non-linear, chaotic even. We take her words as an invitation to pay attention to the process in the present, rather than to its expected outputs in the future.

Staying in the present is also, to quote Donna Haraway (2016) (**SEE Reference 2**), an exhortation to 'stay with the trouble', to actively craft spaces for exchange and the kind of growth that only a commitment to genuine risk-taking can yield.

This approach to teaching is precisely what the Orientation Unit is about. To be engaged in the creation of a learning environment where those intersections of design, futures and literacies can thrive by mobilising (and contesting) the existent, is an active and continuous process. This process demands of us - educators and facilitators an equally active and continuous re-imagining of our practices of teaching.

Unlearning

Through the Orientation Unit, we emphasise the need to be radically open to Unlearning: the willingness to explore different perspectives and change our mind as new and unfamiliar knowledge is presented. This is a fundamental and urgent requirement to make the boundaries of our domain more porous so that divergent modes of knowledge making can be encompassed; as well as being prepared to listen, accept conflict as a generative force and be radically honest, even and especially when it is uncomfortable.
Unlearning: each time we encounter what we don't know, the wager is to 'stay with' divergence. Divergence is what forces us to think differently, to see the world through someone else's eyes, to shed obsolete models and to step into change.

As Madina V. Tlostanova and Walter D. Mignolo observe in the introduction to their volume *Learning to Unlearn. Reflections from Eurasia and the Americas* (2012) (**SEE Reference 3**)] 'Learning to unlearn in order to relearn' is the fundamental principle in the Amawtay Wasi project.

[The Intercultural University of the People and Nations in Ecuador], where indigenous activists, educators and intellectual work with non-Indians to develop a reflective, intuitive and practical curriculum. This is based on a never-ending open process, where learning is never posed as an outside activity, but is inextricably linked to the relational-experiential connection of 'being', 'existing' and 'doing' (pp. 1-28).

For us, this also means acknowledging that the strength and the vulnerability we need to be open to unlearning must come from many sources. The growing scholarship on decolonisation, delinking and decoloniality is certainly the more relevant, useful and humbling to this aim insofar as it pushes us (white western individuals) to develop the vocabulary and the practical/conceptual tools we need.

Positionality

We believe it is crucial to reflect on our positionality and acknowledge how it impacts on our mindsets and actions, as we foster exchange with our students and peers. The key premise is that in any learning environment no one, ever, comes as an empty vessel. Being an educator is not about facilitating one-way transmission of knowledge, neither wishing to impose a blueprint that is the same for everyone.

Teaching is a complex and highly contextual activity bringing together people, texts, images, locations, objects, technologies, and methods in many different ways. These gatherings are situated, multifaceted, emergent, and therefore unique, requiring us to question the notion of best practice and replace it with openness to multiplicity and difference (Bayne et al., 2020). (**SEE Reference 4**).

Our role is to foster an enriching ex-change. This is how we enable genuine change. For us this means admitting vulnerability and being prepared to face uncomfortable situations and the difficult questions, they will bring. It means admitting that exchange can be difficult, especially when it takes us out of our comfort zone, when the positionality of others questions our positionality, our institutional role, our privilege.

Artist and activist Kai Syng Tan in her recent keynote at ELIA conference titled 'Tentacular Pedagogy' (**SEE Reference 5**) made an important point: if things are good for you, and everything is fine, you are the problem.

This is the work we advocate with this Unit. And that's why it's important to stress the ethos that informs it.

Orientation Unit Ethos

The Unit is underpinned by the principles of collegiality and active participation. Teaching, learning and unlearning are to be framed through a collaborative, participatory, reflective, hybrid and transdisciplinary ethos (**SEE Reference 6**). The emphasis on positionality does not mean utter relativism nor the attempt to recompose differences into a unified opinion, or to seek a safety blanket where groupthink dominates.

Again, here the exhortation is to 'stay with' divergence. This process also helps us moving beyond the often-limiting notion of inclusivity which tends to assume a binary regime of exclusion/inclusion and is predicated on one side having more weight, more influence, more agency. Ultimately, more power cultural, political, executive.

Instead, positionality means to always foster a space of active participation where all positions can be shared, intersections can be explored, questions can be asked and bridges can be built, so that everyone can cross into each other's spaces and experiences, even if we don't fully understand, relate or agree with them.

The aim is not homogeneity, but constructive divergence.

Aims

The Orientation Unit has three aims:

First, to maintain criticality in how we relate educational theory and practice to our distinct disciplinary knowledges (for instance whether your field is design studies, future studies, engineering, art, interaction design), and how this understanding informs our teaching practice and learning situations. For instance, what strategies do we use to work with groups? How do we build communities? How do we fine-tune received methodologies into effective situated practice?

The second aim is to grow our teaching practice so that it can respond to evolving contexts in the institution, in policy, and in society. For instance, how do we become actively engaged in decolonisation, social, racial and environmental justice and other urgent matters the world is facing? How do we affirm education as a social purpose, which means reflecting on the future of education, not on the future of educators only?

The third aim is to interrogate and demystify our current academic research, language and practice so to be aware of gatekeeping mechanisms, and how they impinge on inclusivity and diversity. For instance, how do we look at different modes of knowledge-production, how do we recognise in-built hierarchies, and asymmetrical modes of communication? How do we challenge the status quo and cultivate an awareness of alternatives?

Safe v. brave spaces?

Every single space in which we exist as trans people, indigenous people, Black (sic) and brown peoples, disabled people, women and femmes, queer people and/or working-class people is a 'brave space'.

That is a reality and really invisible to those who are not pushed to think about their place in society on a regular basis. Marginalised communities might feel unsafe in the dominant culture so every interaction does not come from a place of safety but bravery (Marquez, 2017 quoting Lily Zheng) (**SEE Reference** 7).

Finally, a note on the images accompanying this piece (shown in the online talk). They come from two workshops we ran in February and March 2020 just before the pandemic hit. You may see them as a relic of the past, with nostalgia, or as a symbol of hope. We wanted to remind ourselves that our educational practice is positioned within a making space, the studio. And we should not forget this, after two years of mostly remote work due to the pandemic. We see the studio as the space where the ethos we have sketched so far can be fully materialised, where those connections are made, those bridges are built, those intersections explored, those positionalities inherent or developed come to the surface. The studio is a creative space both safe and brave for people to take part in exchange, sharing and transformation. Note, however, that 'safe' does not mean being in a group where everyone thinks the same, it does not mean the easy comfort of a bubble. Rather, it means that by actively stepping inside this space we all subscribe to listen, learn and unlearn, even when, and especially when this process stings our core, our principles, our 'way of doing things'.

This is how trust is built so that the vulnerability we have mentioned can be there too, as an integral part of the process that the Orientation Unit wishes to foster.

We conclude with a question: How do you build bridges, and most importantly how do you know if the bridges you are building do facilitate effective 'orientation' processes? Deleuze advises lucidly:

> *Do not count upon thought to ensure the relative necessity of what it thinks. Rather, count upon the contingency of an encounter with that which forces thought to raise up and educate the absolute necessity of an act of thought or a passion to think (…). Something in the world forces us to think. This something is an object not of recognition but of a fundamental encounter. What is encountered may be Socrates, a temple or a demon (1994, 139).[8] (emphasis added).*

To (humbly) paraphrase Deleuze, what is encountered may be our students, our prejudice, or a risky, 'un-safe' situation requiring care, attention, and a commitment to question our own position, entitlement and privilege. For us, this is how educators and facilitators become change-makers, when their practice, teaching, and research are supple enough to unfold in the light of multiple contingencies and escalating crises, and yet sufficiently strong so to engage fully in radical (and non-conventional) transformations towards modes of knowledge-making, teaching and learning, being, existing and doing informed by notions of solidarity, social justice and self-determination.

◄ Figure 6
Working with a
large class at UAL,
FUEL4DESGN in the
Hybrid Futures Lab,
2022. (Image credit:
UAL).

References

[1] hooks, b.. (2003). T*eaching Community. A Pedagogy of Hope*. London: Routledge.

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[4] Bayne, S., Evans, P., Ewins, R., Knox, J, & Lamb, J. (2020). *The Manifesto for Teaching Online*. The MIT Press. Kindle Edition.

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[6] Marenko, B. (2021). 'Stacking complexities: Reframing uncertainty through hybrid literacies'. *Design and Culture*, 13(2): 165-184.

[7] Marquez, A. (2017). 'Safe and brave spaces'. *Medium*, **Link** ↗.

[8] Deleuze, G. (1994). *Difference and Repetition*. London: The Athlone Press.

3.
THE PANDEMIC, DESIGN EDUCATION AND POSTNORMAL TIMES

BY Andrew Morrison & Silke Lange
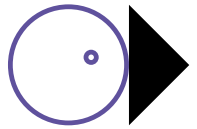
As with other areas of higher education, design education has been under considerable duress, but also filled with energy and adaptations, and some innovations. In this section we consider several questions that have arisen in our own experiences as educators along with comments and queries from our various online sessions with others across Europe and further field, working to support design learning and research in the pandemic.

◄ **Figure 7**
The UAL F4D team leading the session. Standing from left to right Betti Marenko, Pras Gunasekera, Silke Lange. The 'Hacking Futures - Futures Hacking' Philosophical Pills workshop at Central Saint Martins, UAL, 7 February 2020. (Image Credit: James Bryant).

While this forms an aspect of a 'pandemic pedagogy', we see this as a set of intersecting tensions that draw us towards a wider mix of issues and their interrelations as we look upwards and onwards and reflect on what has transpired in these intense times: online, under lockdown, masked and distributed, in home offices and in processes of learning without design studios and shared physical designing on the part of students. These activities may be understood as one part of a wider practice of 'crafting transformative futures' (Dolejšová et al., 2021).

Our questions also are not meant to be negative or dystopian in looking to how the arrival of a pandemic on top of a global climate crisis and its manifestations and its social, economic and environmental effects. Instead, they are offered as openings towards what design education across different types of design universities and

degree programmes and even pedagogies may now need to consider. In our view, these are considerations that, first and foremost, need to be taken with care, for our students and our teachers (Osberg, 2010). This too needs to happen care-fully to effect a number of key transformations within design education in the wider contexts of ecological and geopolitical crises. How we conceptualise, position, practice and appraise these transformations is also a matter of what we see as 'an ethics of pedagogical care' (see also Scherling & DeRosa, 2020; see Essay 5: Care, Engagement & Design Futures Knowing).

Should our design students, commercial partners, co-researchers and public and private funders and colleagues think that design education ought to return to life as normal, they would be deluding themselves. We are all living within and have contributed to aspects of the post-normal times in which we find ourselves – and we will need to continue to provide response-able, flexible and creative reframings of the very policies and practices that have been exposed as unsustainable in a postnormal world and that have led us here, and in our view, also contain us. That we need radical transformation is undeniable. Will we openly, critically and honestly redesign our design universities? Or will be deflect needed and indeed difficult and systemic change in favour of compromises, incremental innovation and the continuation of growth-based logics that are the true fetters against actual, sustainable survival?

Our UK partner UAL recently launched its new long-term strategy: The world needs creativity. In this ten-year plan, UAL outlines its ongoing commitment to the social purpose of arts education; explains how it will be diversifying its staffing body, re-design the curriculum to educate all students about climate change, and reach net-zero in carbon emissions. One of the guiding principles in the strategy is: Giving our students the education they need to flourish in a changing world. This is where the concept of knowledge exchange comes into play and institutions such as UAL can demonstrate the value of creative education to students. It is hoped that growing collaborative partnerships to create economic, social and cultural capital, as well as facilitating innovation locally, regionally and internationally to address global societal challenges will provide knowledge exchange opportunities for students. The anticipation is that collaborating and co-creating with students in these partnerships will enable the institution to decolonise narratives, amplify equitable knowledge production, and redirect dissemination with power to change cultures [Figure 7].

Next, we turn to a number of reflections on our design pedagogies in flux as a means to raising and enunciating a number of key issues and experiences [→ SEE FEATURES 2-4]. This is part of the wider ethnographic dialogical mode of design learning as events and enactments that this book aims to convey. We have been highly active in our local contexts and within and across the project in working with design pedagogies in flux and ways they are making on the move need with to the ongoing reaching for ways realise and enact and ethics of care. Discussions, reflections, queries and annotated commentaries, to mention a few, have been central, for example to the emerging units in I05 that connect methods and tools, to wider means and to related activities as pedagogies in action.
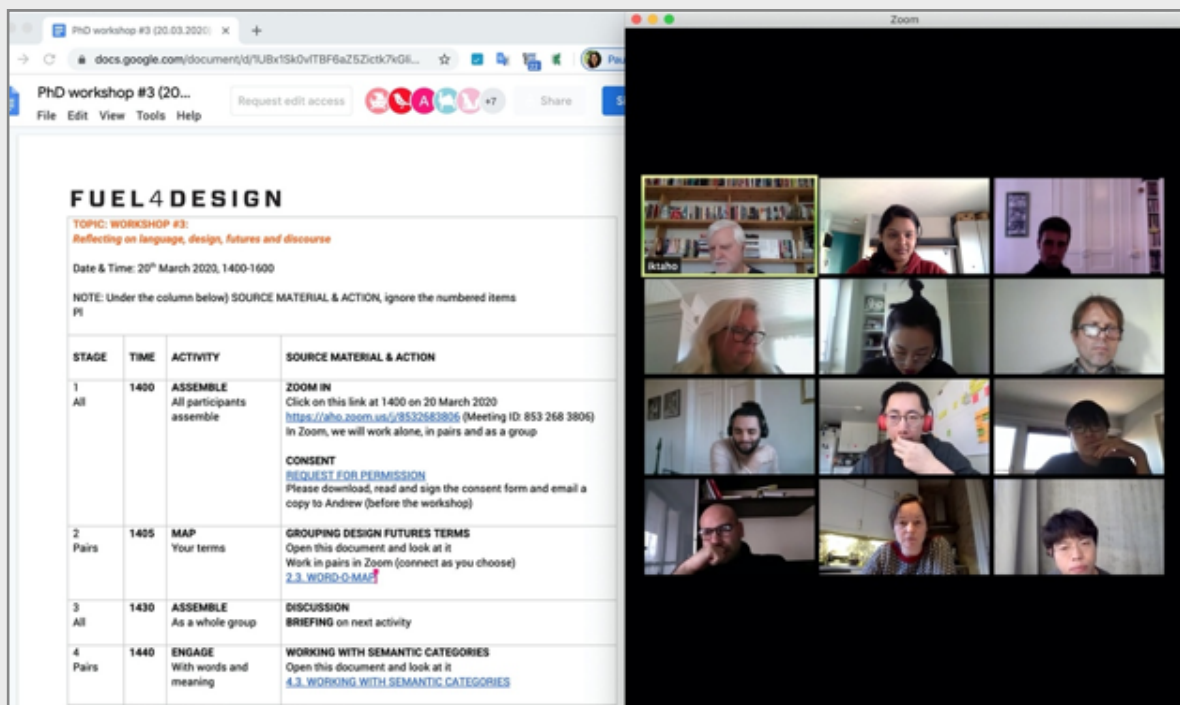
PHD DESIGN STUDENTS SHAPING FUTURES DESIGN TERMS

BY Palak Dudani

BLOGPOST: 19.11.2020 / DESIGN FUTURES LEXICON

AVAILABLE: Link ↗

Reflecting on language, design, futures and discourse, PhD Workshop #3. NEOLOGISER, AHO, 20 March 2022. Teachers and facilitators: Andrew Morrison & Palak Dudani

▲ Figure 1: A screenshot of PhD students participating in the NEOLOGISER workshop over Zoom-

▶ Figure 2: Screenshot of the template WORD-O-MAP.

▶ ▶ Figures 3 & 4: Screenshots of notes by a PhD students participant, showing the use of softwares such as Miro and digital notepad during the online remote workshop. Photo by Ammer Harb of PoliMI (top) and Nan Xia, guest at AHO (far right).
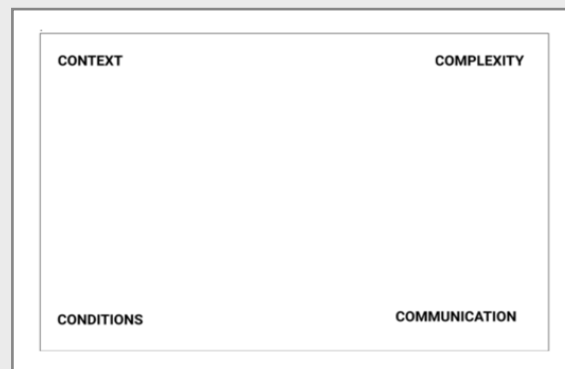
Shaping futures design terms

Words are dynamic such that their meanings arrive, develop and change in use and over time. They are elastic and plastic such that they can be shaped and altered, moulded and given different identities and connections.

New terms or 'neologisms' come into being through the combination of parts of others, or a change from one part of speech to another.

The NEOLOGISER workshops build on the DESIGN FUTURES LEXICON and pay attention to the role of words as design material. The tool intends to help designers become more sensitive to the importance of words in shaping futures by highlighting that words are carriers and shapers of meaning.

Through a series of activities and resources, NEOLOGISER strives to familiarise designers with the idea of creating new words or 'neologisms'. The workshop was therefore designed to support PhDs in generating new words for FUTURES DESIGN and DESIGN FUTURES LITERACIES by using a set of action prompts that reflect the character of word formation at a broad level and thereby also for their own research project and related design work.

This involves designer-researchers becoming aware that neologisms are a common part of everyday language and engages them to also become comfortable with the idea of making their own new words and consequently building concepts and developing related definitions.

The session worked through a number of related resources from the LEXICON to achieve these goals, as we now present. The session included participants from the project partners.

Stage 1: Grouping Design Futures Terms

The workshops began with introducing 50 FUTURES DESIGN TERMS to familiarise the participants with terms and how they can be used to position their own research work. Once the participants have chosen the terms they find relevant for their work, they can begin to categorise it into the WORD-O-MAP template. Participants are able to make connections between the terms and reflect on how it relates to their project. In the workshop discussion after the exercise, one of the PhD student participants said that for them using the WORD-O-MAP 'opened up new reflections and perspectives connected to my PhD work'. Another participant found it 'very helpful in segmentation and categorising the 'understanding' of particular terms also for the terms used in research that were not in the list of words.' Reflecting on their own PhD thesis work, one of the participants reflected that WORD-O-MAP helped 'uncover some terms that can represent a special situation, and make my research leaner'.
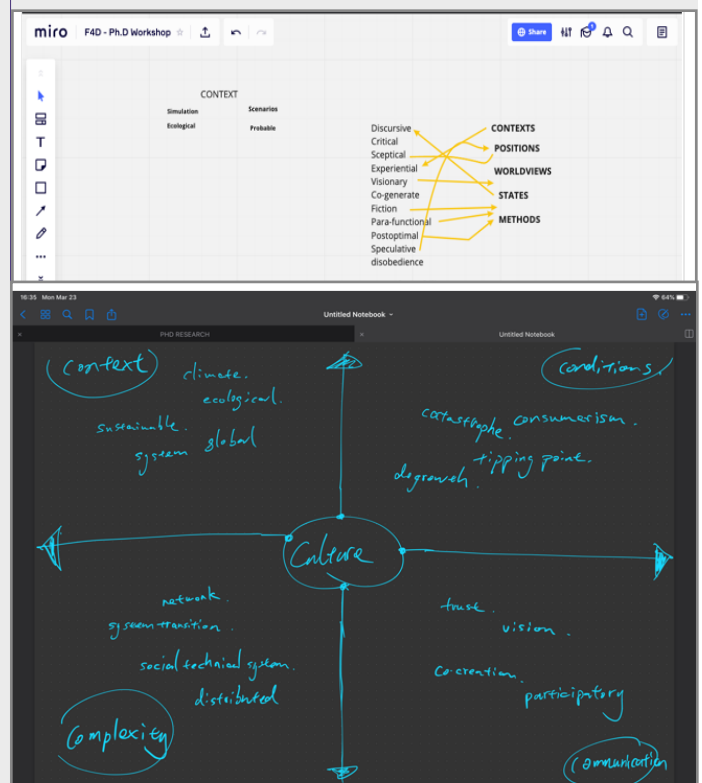
Stage 2: Working with Semantic Categories

This section focuses on words as meaning-making devices and how they can be shaped as just any other design material. To inspire the participants to look at a diversity of related words and identify and explore possible others, UNIT 5.3 WORKING WITH SEMANTIC CATEGORIES is shared in this stage.
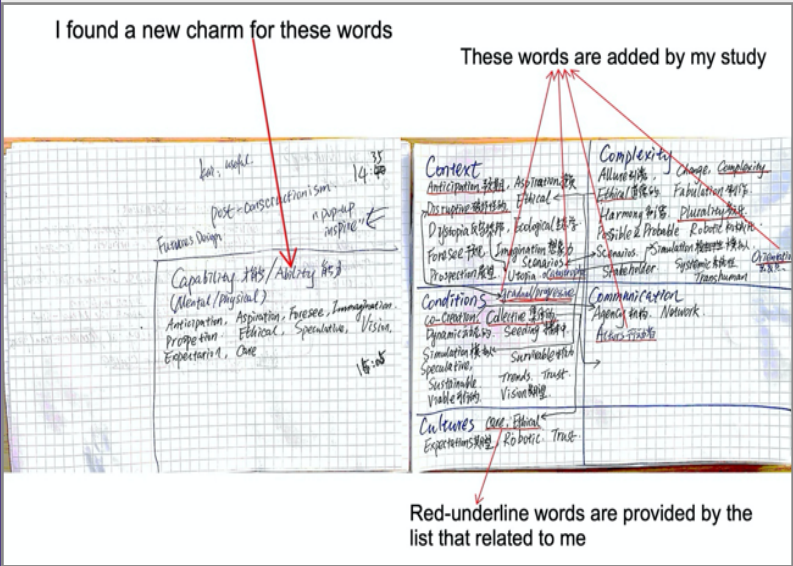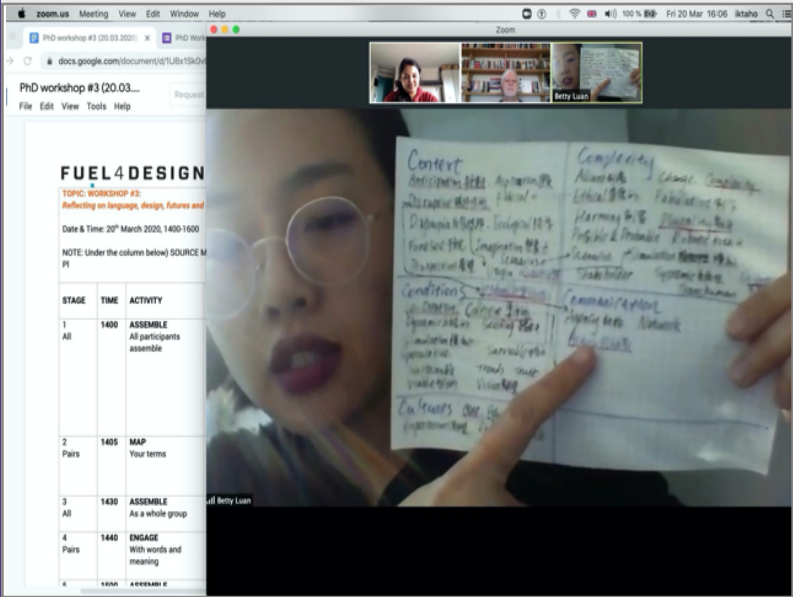
Participants go through TABLE OF SEMANTIC CATEGORIES which helps develop a specific sense of what different semantic categories are and how designers can sort design futures terms. Once participants have refined their own understanding, they go through TABLE Of SEMANTIC CATEGORIES (List with words) where they can see how futures terms are categorised.

Another felt that 'a classification that better fits the design research category can help me track more accurately and quickly.' The participants felt that going through WORD-O-MAP first helped them 'think where my words belong to' and 'it can help to explain some special designerly terms, especially when I am at a loss for words.'

CONTEXTS	CONDITIONS
broad and specific areas and domains in thematising futures	pressing situations, concerns and settings about the future
ACTIONS	POSITIONS
future facing ways of performing and enacting	points of view about and on the future and shaping futures
WORLDVIEWS	STATES
perspectives and philosophies behind approaches to futures	positions and views in shaping futures
ACTORS	THINGS
persons or groupings who take part in a future related activity	objects or artifacts involved in a future event or process
SENSES	FEELINGS
modes of human experience and engagement in and for the future	expressions of emotions and feelings concerning the future
ATTRIBUTES	TRANSFORMATION
qualities and characteristics relating to the future	changes and effects via applying futures concepts and methods
PROCESSES	METHODS
steps, patterns and paths to future experience and engagement	qualitative tools and techniques for shaping futures
TEMPORAL	SPATIAL
time and movement aspects and elements in working with futures	space and shape based elements and relations in understanding futures
MEDIATION	ETHICS
means and modes of future oriented communication	principles, values, norms and behaviours in a future facing view
GOVERNANCE	ECONOMICS
strategic, regulatory, policy and management of futures	financial, advantageous and business related future views

▲ Figure 5: Screenshot of the TABLE OF SEMANTIC CATEGORIES

In discussion, one of the PhD students noted that the 'categorisation helps a lot in seeing terms in their proper context.' and that 'it could be quadrants for design research.'


▲ ▲ Figure 6: A screenshot of a PhD student discussing their notes over the Zoom session of the workshop.

▲ Figure 7: A screenshot of a PhD student notes, showing how participants documented their reflections during a remote synchronous workshop session. (Photo by Zhilong LUAN).

Stage 3: Making new design words

As the UNIT 8.1.ON NEW FUTURES DESIGN WORDS notes:

Designers are always working with words in the ways they talk about what they are doing and what they encounter in the works of other designers. In these ventures, words may be formal and have some fixity. Yet they change and twist and turn as we use them and play with them, for serious and joyful reasons.
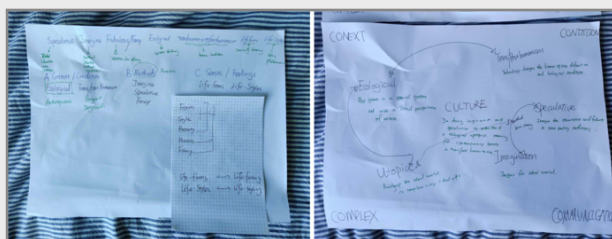
▲ Figure 8: Photos of PhD student notes, showing how participants used paper formats while doing activities during the NEOLOGISER online workshop session.

The participants go through UNIT 8.1. ON NEW FUTURES DESIGN WORDS and UNIT 8.2.MAKING NEW FUTURES DESIGN WORDS which introduces them to six ways of making new words.

Stage 4: NEOLOGISER

In the last stage of the workshop, the participants go through the NEOLOGISER and experiment with new words.

Some of the terms being put in categories 'made better understanding', one of the participants reflected. Making neologisms further made the participants pay attention to the elasticity of the words 'in particular for some of the vague terms or how the terms can be used interchangeably'.

Discussion and Reflections

In the concluding discussion at the end of the workshop, the PhD student participants had begun to enjoy experimenting with new words. One of the participants noted that this workshop 'showed the complexity of words and how difficult they are to define clearly.' Another participant remarks how having an archive of words helped them see how 'each of them gives new colours to my understanding, endless possibilities of variations.'

A PhD student who's looking at the role of culture within service design felt that this workshop helped them see how they can try and 'use the en-activity to explain the value of the design process to culture.' Another participant reflected on 'terms I use and see them from other perspectives, to search for terms I use but could not find. That in itself is interesting. Do I only use terms from my "field" or should I look around for others?'
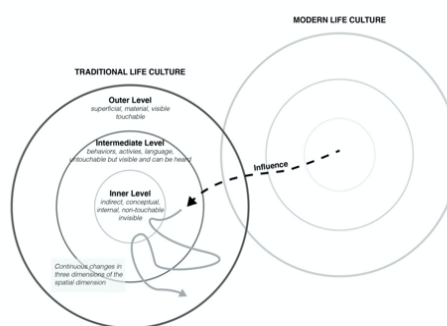
"The culture has both a spatial and temporal dimension. Each spatial layer of a culture represents the specific structure and characteristics of that culture at a specific point in time. If the spatial dimension is the cross-section of culture, then the temporal dimension is the longitudinal section of it. Different temporal layers illustrate different structures and characteristics of a culture in terms of time." (Michael Siu, 2005)

▲ Figure 9: A screenshot of a diagram made by one of the PhD student participants showing the use of different visual formats for reflecting during the NEOLOGISER workshop. (Photo by Nan Xia).
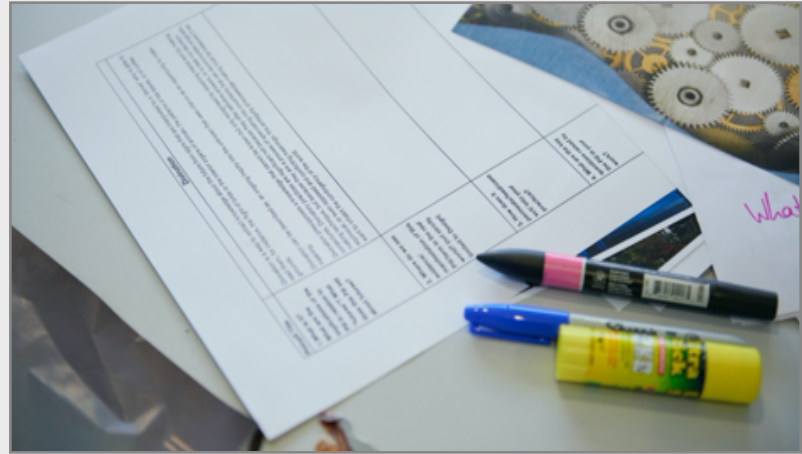
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REFLECTIONS ON REMOTE PRACTICE

BY Pras Gunasekera

BLOGPOST: 06.02.2021 / FUTURES PHILOSOPHICAL PILLS

▲ Figure 1: Initial 'containers' for the Future Philosophical Pills. 7 February 2020. (Image credit: James Bryant, 2020).

It's nearing the end of February 2020. We (the UAL Team) have facilitated our first workshop with postgraduate students from the UAL community in early February (see Silke Lange's blog post "Hacking Futures – Futures Hacking: reflection on co-created futures") which gave us the opportunity to test out the first iteration of four of the final 40 Future Philosophical Pills, which at that time were initial draft containers for information (see Fig 1). Through a process of collaboration and co-creation with our postgraduate student cohort, we realised that we had to crystallise aspects of content and design a system to engage with it in order to make the Philosophical Pills, well, digestible.

As we closed the Hacking Futures – Futures Hacking workshop in February, the students were vocal in their interest in supporting the development of the Future Philosophical Pills through another workshop. Not only would this provide a timeframe with which we could develop the Philosophical Pills, but also another opportunity for students

across the UAL campuses to come together to co-produce, facilitating cross-cultural communication and connection as a community of practice in order to think, make and learn (Eyler, 2018). We eagerly set a date for a follow-up workshop.
It's early March 2020. Through design development and iteration, we created print-and-play card decks for the Philosophical Pills, containing nine clusters (each cluster containing four Philosophical Pills) along with ten groups of Prompts ranging from side effects to ingredients that could be drawn upon to activate the Pills. We have refined our materials and I can feel the energy building as we prepare to come together again as a team and facilitate another workshop when something from the pluriverse arrives...

The emergence of COVID-19 has started to take effect globally and countries within Europe are starting to close their borders in a bid to slow transmission. I am based in

Berlin and it became clear that I would not be able to be physically present in the workshop and that we were going to test out supporting from a remote perspective. This is not to say that this form of working was totally new to us: I had been working remotely or at distance since the project started and our wheels were somewhat greased. We work well as a team, utilising different platforms such as SharePoint for project organisation or WhatsApp to communicate with each other as and when these are needed but this was different. A precursor to what was to become the 'new normal', this was a remote facilitation pilot.

▲ Figure 2: Blended facilitation. 6 March 2020. (Image credit: James Bryant, 2020).

I began to realise what now seems commonplace – collaborating in a remote context requires a different, repurposed set of skills.

The ingredients that facilitate facilitation like body language, the natural flow of conversation (or knowing when to contribute so that it doesn't feel like an interjection) and the subtle cues that you pick up from one another by being in the same physical space are removed, reduced to a 15-inch digital frame through which you have to push (sometimes strain) your charisma through in order to keep the connection (not talking bandwidth here), energy and groups 'moving'. This was a new experience for me with which to reflect, learn, iterate and apply.

The pandemic presented a pivot point for us in relation to the Future Philosophical Pills, for our planned event Speculative Space and raised key questions as to how we approach collaboration, teaching and learning, design practice and...being human.

John Heskett (2002. 6-7) argues that the history of design can be seen as a process of layering:

… in which new developments are added over time to what already exists. This layer, moreover, is not just a process of accumulation or aggregation, but a dynamic interaction in which each new innovative stage changes the role, significance, and function of what survives.

The pandemic may not have presented a new development, more so a point of transition or a portal between one world and the next (Roy, 2020), with which we were

▲ Figure 3. Blended facilitation. 6 March 2020. (Image credit: James Bryant, 2020).

propelled to rethink and innovate on what we had achieved so far. Perhaps, without the pandemic, the next Pills iteration would have been to reconfigure the content into an online interactive tool. Due to the pandemic, this became an imperative next step.

We began to focus our efforts on iterating our materials and developing the 'journeys' that could unfold when utilising the Pills and Prompts in order to feed into the development of a 'beta' interactive tool.

It's October 2020. The materials we have co-created for the Future Philosophical Pills have been made available on the Fuel4Design site. Most importantly, Speculative Space will happen as an online experience. Thus, we have created an initial iteration of the Future Philosophical Pills as an online interactive tool. Thinking back to the first pilot of remote facilitation in March and all the subsequent teaching and learning, I have facilitated online, I prepare myself for the upcoming event – our team running through the 'participant journeys' on the multiple platforms we would be utilising for the day.

Speculative Space provided a key opportunity for us to gain insights as to how our partners and critical friends within design and pedagogy engaged with the tools and importantly, in an online facilitated environment across multiple platforms. Insights that would not only help in fine-tuning ways to engage with the Pills but also our approaches to online facilitation.

Looking back over the past year, developing the Future Philosophical Pills during a global pandemic has not only encouraged us to explore and design tools to facilitate philosophy in action but also, as educators through practice-led teaching, to innovate what we do and how we do it to meet the demands and challenges of this very specific situation.

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▲ Figure 4:. Speculative Space, Miro board. 6 October 2020.
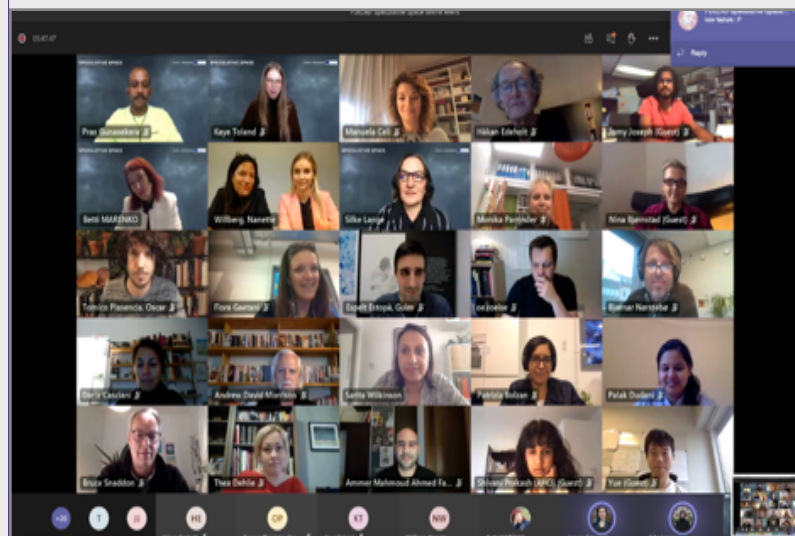
▲ Figure 5: Speculative Space on MS Teams, Europe. 6 October 2020.

SOME EXAMPLES: AUGMENTING DESIGN FUTURES PEDAGOGIES

BY Palak Dudani (AHO)

Design Baithak (**Link ↗**):
This was a semi-formal weekly discussion format co-organised by designers and artists in North America and South Asia. Held over two time zones, it brought together students, scholars, and professionals in the creative arts and design from all over the world, to discuss ideas and alternative ways of working within the context of creative (reconfigurative) practice.

The otherwise school (**Link ↗**):
A project based summer programme critiquing the role of technology in global forces of oppression, and find ways to actively imagine and prototype tools, techniques, and strategies for counter-fascist work.

Pluriversal Design (**Link ↗**):
Aims to create a platform for discussions about unlearning the productivist objective of design in order to find goals and values for a different type of design practice that is not born out of the patriarchal-capitalist world view.

Other Futures Festival in Amsterdam (**Link ↗**)

The Digital Methods Initiative (**Link ↗**):
From the University of Amsterdam, a subscription-based event that builds on a long history, e.g. digital sprints.

Off the books (**Link ↗**):
Labour, inequality and informal economy.

Decolonising Design (**Link ↗**):
An online seminar and discussion series on and its open access online resource generation and sharing around key themes hosted by Ahmed Ansari (NYU) in the U.S.
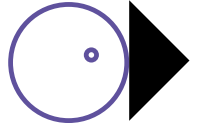
Design Opressão (**Link ↗**):
An online seminar series offered by UTFPR Brazil is an attempt to recontextualise Critical Pedagogy to 2021's pandemic emergency remote education.

4.
INSIDE DESIGN PEDAGOGIES IN FLUX

BY Andrew Morrison & Silke Lange

As a way of reflecting further on the potential re-futuring of design education, we have drawn up a range of questions arising out of the diverse encounters involved in realising most of the project since 2019 in the context of the global pandemic. These are questions we might ask ourselves as a specialist and heterogeneous HEI sector. Here we offer responses to one of a set of questions as prompts to critical reflection on 'design pandemic pedagogies'.

The responses are conveyed as a mode of sense making and shaping ethnographic multimodal dialogical discourses for design pedagogy and its situated study (e.g. Celikoglu et al. 2020). Readers may also opt to answer one of these questions in detail, as below, or perhaps in a workshop session take up some, several or all items in pair and group work. There are, of course, other and different questions to these.
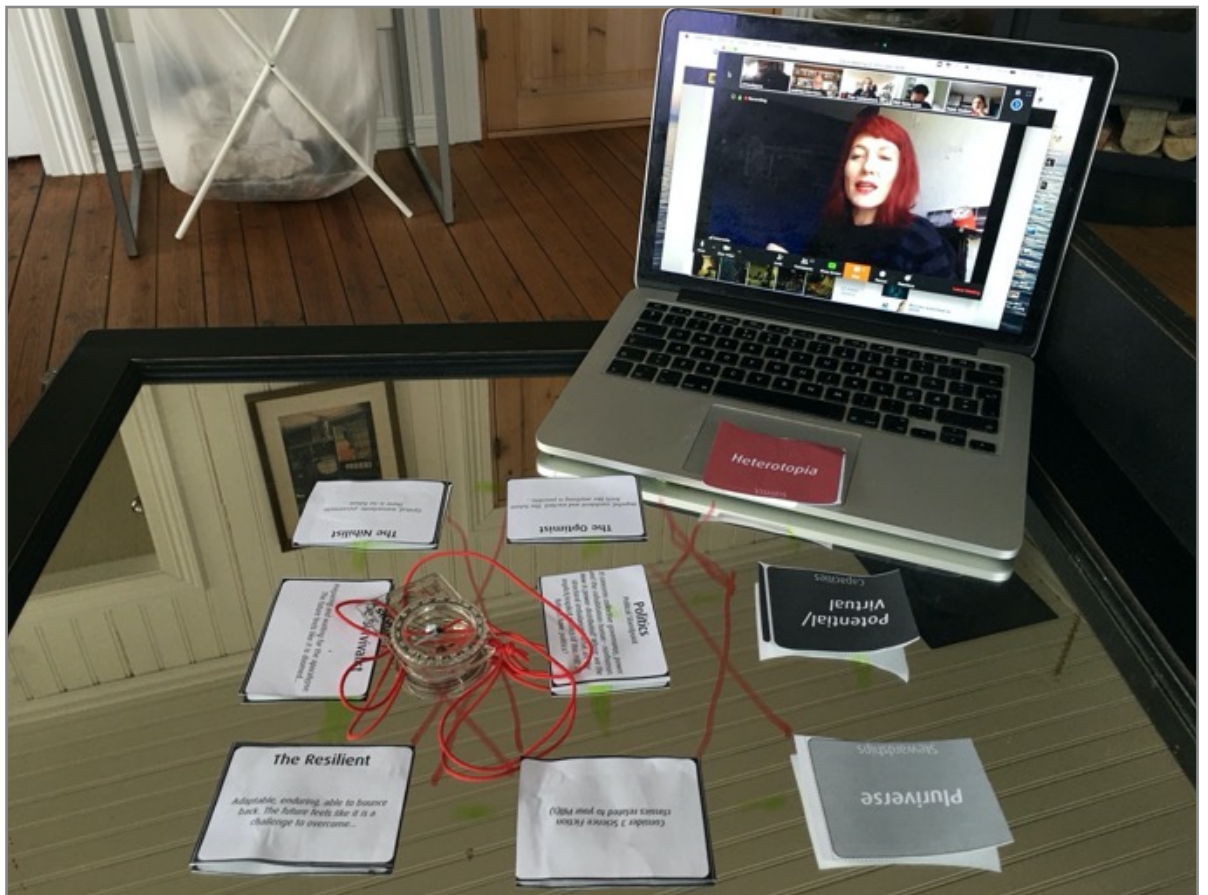
▶ **Figure 8**
Collaborative
Participating
remotely
in a FUTURE
PHOLOSOPHICAL
PILLS workshop,
2020. Perspective
from a designer-
choreographer.
(Image credit:
Amanda Steggell)

This subsection is accompanied by two images from a joint session in connecting the PILLS and LEXICON with PhD students at AHO and the inputs on movement as a mode of engaging with embodiment, materiality, futures and world views. While students and AHO host were in Oslo, and our UAL partner Betti Marenko online from London, our choreography co-project partner Amanda Steggell was at her summer house near Oslo and worked spatially to connect the physical PILLS cards she had produced there, laid out with threads and on a class top table while engaged over distance with their designer and teacher Betti [Figure 8]. Drawing on co-development on movement words in the LEXICON, Amanda revealed further embodied connection between the tools and the environment, human and non-human, digital and physical [Figure 9]. by bringing a home-made birdhouse into her own home and the 'domestic' rural space of her daily life within an online formal project structure and our own 'working from home' pandemic settings. Teacher reflections on matters of flux inside design futures pedagogies have been taken up in a number of dialogues in the project, such as in by colleagues at UAL [FEATURE 5].

◄ **Figure 9**
Collaborative Connecting the PILLS to material contexts, between the physical and digital, verbal and embodied. (Image credit: Amanda Steggell).

DESIGN PANDEMIC PEDAGOGIES

BY Pras Gunasekera and Silke Lange (UAL)
CONVERSATION: FUTURES PHILOSOPHICAL PILLS

What did the pandemic do to existing design education?

Silke: I've been thinking about what the pandemic has done to existing design education and it's made me reconsider the role of the physical design studio. Is this something that you've been thinking about as well?

Pras: I think the pandemic in general and not just related to design education has highlighted inequalities and I think linking to the design studio - inequalities in access. Accessibility. I think we've had an assumption that there is fair and equitable access to spaces like the design studio. We've made a switch to being online and using platforms such as Miro, but I think it's really highlighted the unequal access especially when we think about space. You know, we assumed that all of our students had their own home studios but as we learned this was not the case. Some of our students are sharing spaces with siblings, with family members, having access to one digital device only.

Silke: Yes, that is so true.

Pras: How do we reflect that in the present and future of how we design, design education?

Surely this is about modifying our pedagogical approach, which includes thinking about the types of design briefs we write. How are we not reflecting that experience and asking how design can do more to make our learning experiences more equitable?

Silke: That's really interesting because that gets me thinking about how we can move towards designing teaching, learning and particularly assessment for social justice.

Because some of the design briefs I see, are based on existing practices in Design, the briefs aren't necessarily looking into futures. We have talked about pluralities and other contexts as part of this project – this has not yet been translated into briefs. They do not consider the realities of the worlds that our students are coming from, living in and the experiences they bring to their education. So, in that sense, I actually feel that the pandemic has put a spotlight onto these issues.

There is a lot of talk about wanting to go back to normal. No, we can't. It's very important to evaluate how we adapted throughout the pandemic, what we were

doing and how we can use what we've learned to create more inclusive, more accessible design studios. Through using tools such as Miro, I think we've explored what a design studio can be online.

Pras: A virtual studio space.

Silke: A virtual studio space. Yes. Where you then can work with people all over the globe.

Pras: I'm really finding the term 'returning to normal' or 'going back' very counterproductive because as Arundhati Roy highlights in their Financial Times article, the pandemic is a portal, which I think is a really thought-provoking metaphor as there is no going back.

However, I wonder what the desire to go back is for? To stay with existing hierarchies and power structures?

Because if we acknowledge that we can't go back, then we have to change, and I think that might be quite difficult for some educators as well because you have to question your positionality.

Silke: Absolutely, absolutely.

Pras: And acknowledge that 'if things are good for you, and everything is fine, you are the problem' as was said by Kai Syng Tan.

Silke: Yeah, definitely. We actually talk about that in our text, Reflecting on Our Pedagogies.

Pras: It stuck with me because there has been a significant moment, two years, not even a moment, but two years, that we haven't reflected on and really taken stock of.

Silke: I totally agree, and this is very much about that our institutions don't pause.

We constantly move, the next academic year is already around the corner, which is interesting because schools have paused in this country, at least, there are no SATS this year. The focus is on learning, catching up on the learning. I don't think we've had this conversation in the higher education context.

Pras: I actually have not even thought about that. We talk about design futures, you know, design pedagogy, but they sit within an institutional framework and you're absolutely right. It's all well and good redesigning modules and the content for them, but what about pausing and taking stock of some of our institutional processes?

Silke: Absolutely. It's interesting that we often say we design our curriculum so that we respond to societal challenges, to current political environments but we can only do so within the limits of an institutional framework. That is a contract and if you don't follow this institutional framework, then you break the contract. Especially in Britain, where students pay fees, and the student is perceived as a consumer then they have the right to sue the institution. And to go back to the question in terms of what did the pandemic do? I think to some extent the pandemic did make us pause. We had to reconnect. We were forced to introduce different technologies that not everybody thought would be suitable for design education and we had to reconsider what learning outcomes are because physical production wasn't possible. We weren't in the design studio, so therefore students were producing work that had to be displayed online, in the virtual studio.

Pras: I think there was a realisation that we can't simply translate analogue studio practices into the virtual realm. There can't just be a direct, literal translation.

Silke: Well, some people tried and that didn't work. Some thought they could literally translate the teaching practices that they were using in the studio into the online environment which didn't work because we didn't design our courses to be online. I really think that this time has created a space for educators, whether design educators or educators of other creative disciplines, to think about how we can reach different audiences or invite different students to study with us.

Pras: I think maybe specific with Central Saint Martins, and I think of Product and Industrial Design in this context. What did the pandemic do to existing design education? It did remove that as designers, we design for, and hopefully with people by immersing ourselves into context, and we forcibly had to remove that aspect of engaging with and understanding people in a human analogue context. We can read about the impact reducing us to a frame on a screen has had on social behaviour, but how has that impacted the designer's skill set? Do you know what I mean? I think in my context, when I am speaking to students about primary research and going out there and observing, engaging, understanding how people behave, that has been removed or reduced.

Silke: Maybe it's become something different. You can still go out. You know people were still going out, but they were interacting very differently with and within the space. You know the physical distance that everybody had to keep, that was something very new and now we can see the impact this has had.

Pras: Yeah.

Silke: I don't know if it's the same in your institution, but students have to relearn the social interaction within the learning space right now.

Pras: Absolutely.

Silke: We really recognise this, especially with our international students who weren't embedded in the culture and language. If English is an additional language for them, they weren't exposed to this language as much as they would have been otherwise, had they come to the building, and it will no doubt affect their learning experience.

Pras: We definitely have to transition to being back in person again.

And I have found that scheduling teaching and learning sessions online, in a way was easier to structure and I've now realised that being back in person, I need more time because the discussions are far livelier.

Whereas I think in online teaching there was a sense of speaking into a void at times or a drop in participation. Maybe because it wasn't human, or it didn't feel as human.

Silke: Is this because the students are contributing and engaging to a different level?

Pras: Yes, and I've spoken to other facilitators where they have all talked of the differences. You realise now being back in person, if you are doing any workshop-based activities you have a real sense of eyes are on you again. Because being in person, there is a different engagement. Which is positive.

Silke: And different skills you talked about earlier. These are very different skills - to socially interact - and I'm not quite sure we have really grasped all the skills we need to learn to design distance learning courses

or learning online, because that's a whole other skill set that we need. When you set up a discussion forum, for example, you have to know how to manage that, how to facilitate the interactions. They don't just happen.

Pras: Yeah, they need to be facilitated in a different way.

Silke: It's a very different form of facilitation, not like the in-person context you described.

Pras: My only worry is whether we have reflected enough on the last two years? Maybe there is a fear, and we know reflection doesn't always happen in-action but on-action. Maybe it takes a bit of time. I assumed that there would by now be more design briefs in my context in relation to the pandemic. You know, like what have we learned? Maybe it is because of this desire to 'return to normal' and 'business as usual' instead of how can we take stock of what's happened over the last two years and reflect that within design pedagogy?

Silke: Well, the interesting thing is that a lot of our work focuses on social justice and environmental justice, and we are aiming to reflect this in the design briefs. They focus on climate emergency, and there is a direct connection to what happened during the pandemic.

I liked the stillness when there was very little traffic. The fact that we just stopped. We assume that we can't stop.

Pras: In our capitalist society...

Silke: In our capitalist society.

Pras: But we did.

Silke: We did absolutely, of course, it was to the detriment of economy etcetera.

Pras: Context being everything, how we have not engaged our students in all that has come to the fore in the past two years, the massive inequalities for example, the unequal access to technology. Especially in places like Berlin or London.

Silke: Well, bandwidth, access to devices. The quality of the devices; just because you have a laptop doesn't mean you can access certain software. The licenses of softwares. Our entire university had to be turned upside down to allow certain students to continue with their work.

Pras: I mean in the technology university I am teaching at; I'm interested as to why we have not engaged students to think about increasing equity and access to technology? Given the pandemic because it hasn't just suddenly been OK, everything's fine now. It's highlighted these inequalities, but I don't know whether we're engaging or showcasing this to students and asking 'OK, do we want to change this? How do we want to change this?' And that's design education and practice.
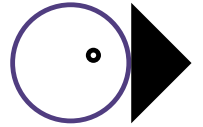
Silke: Absolutely. I mean this is totally related to Design. It's a Design question and whether it's a Design question in terms of the environment you create or the devices you create or the processes that you create, this is all about Design.
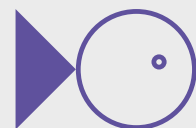
5. TENSIONS IN RESHAPING DESIGN FUTURES PEDAGOGIES

BY Andrew Morrison & Silke Lange

Introduction

In these ventures into design futures literacies, we have identified three main tensions in taking up design futures pedagogies in the context of changing conditions and crises. These are: 1) Immediacy-Durability, 2) Organisational Contexts-Civic Agendas, and 3) Experimentation-Articulations. We have taken up the figure of the tension (taken up as controversies by Williamson et al. 2021) as a device to accentuate that 'Changing design pedagogies for changing futures' is - and will likely continue to be - a delicate, difficult and demanding pursuit. We also see that it needs an interplay of dialogue and hybrids that involve experience and feelings, analysis and intuition, senses and schema.

1) Immediacy-Durability

By Andrew Morrison & Silke Lange

Tension: Being confronted by the immediate and the urgent while needing to look ahead to assembling and supporting pedagogies for long-term sustainable futures.

Our design futures pedagogies are complicated by how we position them temporally. At one level we are confronted with needs that are acute and urgent. They demand responses and support by way of adaptability on the run. At another level, short-term responses may patch over deeper needs and development of long-term strategies for durable change and sustainability that will outlast a sudden crisis. In opening out for paths to transformational learning we will need to work with aspirations that are temporally as much as affectively framed. This is whether we select to highlight dystopian, atopian and utopian views (e.g. Moylan, 2020) as part of the persuasive but also co-creative designerly making and offering of alternate futures that are made material in the present. These both need to be seen in terms of temporalities of our design pedagogies (see above on 'Anticipatory Designing'; see also IO5 FUTURES LITERACY METHODS, [Figure 10].

If the pandemic has raised one shared experience and view, it's that futures design education needs to pay closer attention to time. For Adam and Groves (2007: 190), we need to recognise our timeprint and practices as future makers who pay attention to uses of conceptual tools through acts of 'relating and reconnecting, embedding, embracing and embodying'. These too need to be framed in a mode of concern and care. Time, we argue is too rarely discussed together as part of design pedagogies. It is an inescapable topic, despite its fleeting and intangible qualities. Yet how we may deploy

it – carefully, critically and constructively - may too often be displaced by the force of managerial machineries of online tools and a potential over-structuring of spaces needing longer or entangled emergent processes.

Our collective loss is much voiced by colleagues in all the design venues with which we have discussed and presented the FUEL4DESIGN project and this is about how we need to look at what time design learning takes and needs to be rethought as needing to take, given the pandemic and its deep challenges, from the personal to the global. Design futures literacies are complicated for others to perhaps understand as design education is woven into shaping futures in which learning is not only about hindsight and memory, attention to the present and more immediate experience, but the anticipatory. We need to attend to contemplative acts and spaces and to doing less, to allow ourselves to process and to anticipate. Education demands going fallow and to being contemplative. It may need more and deliberate intellectual, creative and ethical pedagogical resistance to the near-automatic, and some would say reactionary, responses to fix, solve and power up our creative selves to immediately design our way out another pressure point or challenge.

Figure 910 ▶
An early Zoom session connecting the PHILOSOPHICAL PILLS, LEXICON and online design futures learning, PhDs at AHO and UAL and AHO project staff. (Image credit: Amanda Steggell).

Here attention to the temporal and its related practised and pre-rehearsed behaviours may reveal the very tensions at the heart of reshaping our curricula. We need to this attend to practising making differently and that too takes time. But it can be invested with quirkiness and serious play, actual STEM partnerships, co-creative endeavours in the wild and in counteracts to ways of working we can't yet see how to alter. We need pauses, intervals, transitions and experiments while we also need directions, points of arrival and pathways we can share. In a collective, organisational psychology futures-oriented change view, we need these to fuel and nurture ourselves in reaching for and realising informed, collaboratively shaped transformation of design futures education. Humour, patience and deep listening have been revealed to be key components of recent online exchanges; in early months of primary lockdown, we seemed to all be less

'produced' in our online appearances and less rehearsed in flipping between screens and more tolerant of 'online fluency' and temporally driven processes in shared spaces (e.g. Figure 9). Into these processes, and their ongoing alterations and adaptations, time is part of individual learning journeys and co-constructed via collective cognitive activities and cultural configurations. In these pursuits we need to continue together openly assemble and assess futures views through which we offer options and hopefully some indicative insights for our colleagues, funders, partners and, above all, students.

In **Essay 4: Time, Design & Anticipatory Learning** we go on to outline some of the main conceptualisations of time as: Durative, Multiple, Impermanent, Becoming, Multiscalar and Intertemporal. Next, we take up these concepts in discussion of how we might attend more consciously, even strategically, in thinking through and with and from experience in working with time as a material in learning design futures literacies and the pedagogies that might support their materialisation and applications. Following Adams and Groves (2007) this is to do with considering and working with the notion of 'timeprints' in our pedagogies. This raises numerous issues and questions, such as the following:

> *How then might we begin to rethink our design teaching and learning 'post-pandemic', in a period in which a minute virus may shift to being globally endemic and not erased for some time to come? How in this additional shift might we engage in developing our design based pedagogical temporal practices of preparing and facilitating the readiness, curiosity and environmental and societal awareness of up-coming designers and design researchers?*

Online working has been pressured and screen dominated, with intensive digitally mediated work in which time organisation and temporally structured processes to have been central. Many educators have commented that they have seen their departments and connections with colleagues and other partners, now all in remote mode, to be more effective and efficient than earlier organisational practices. While decrying the loss of face-to-face and more physically embodied interactions, design teachers and students have together been connected to the machinery of online calendars, time-based meetings, and more specified learning encounters. Naturally, this has also been at the cost of the emergent and the situationally rich interplays of physical studio cultures. However, our 'lockdown literacies' have exposed our practices of timekeeping, the clarity purpose of some teachers and students that has improved in online arenas due to more specific, shared and co-experienced temporal events [→ SEE **FEATURE 6**].

While flipping between temporally tiled Zoom sessions and in layering and scoping and scaling our uses of time (durative, prospective, etc.), temporality has become both more visible to us as a material in our design pedagogies while being something that might be over patterned and managed. No loitering in the digital studio? Time has become something we have needed to reschedule, share more openly through calendaring, make available to others within which to participate in open and collaborative

events. Time has become part of the learning encounter in design futures literacies. Importantly for students, highly apparent has been the ways in which time has been used in bounded online time of learning events and the self-structuring of distributed learning at an individual and group level. Might we have included time for fewer directed purposes with drifting, dwelling and navigating within online venues and resources being some of the additional modes of making meaning through pursuing brief and following emergent processes? When might this seem like an abdication of support from design teachers who are more used to being nearer physical and even digital artifact production processes?

Granted, how time factors into collaborative making and analysis has also been highlighted, and the need for time to support the psychological, emotional and physical learning needs of our design students learning to design and to research has accentuated the personal, developmental and individual who often needs to work in groups and learn to facilitate design processes with others in which time may also be more fully considered. But there are not always the related financial provisions or the taking care ahead of time, the anticipation of working with futures that are unstable, emergent and in compressed ways.

Our time practices in design learning matter, such as just-in-time support, feedback loops online, delays in the dynamics of learning online and back in studios as psychological processes unfold connected to physical and mental health and expectations, the knock-on effect of rescheduling and by others that upends wider plans and support for others, prioritising time as a shared resource and the list is more extensive. These temporal practices are now implicated in the co-occurring challenges of a pandemic and climate change.

We have been engaged in intense, emergency modes of educating ourselves (teachers, researchers, undergraduates, masters and doctoral students alike, but also administrators and managers). For us all, this has manifested itself as and in shared period of experience, daily and longer-term work and work and massive public health systems and services, and their politics and permutations. As Seravalli et al. (2022) argue, innovation and collaboration are important in reframing notions and institutional practices of design and the public sector.

In these experiences and the transformations and re-inscriptions of existing power relations in design pedagogy, time has been brought to the forefront of our daily lives, existentially and pragmatically. Overall, our design futures literacies have been revealed to be temporally challenging. We've engaged and continue to do so explicitly or less so, with conceptualisations and futures-oriented practices. This has taken place within and beyond design - directly, liminally, in our embodied selves and collective identities and positions.

Temporal experience, awareness and criticality are now unavoidably on our screens, in our distributed selves and shared networks, and importantly now back within our classrooms and studios, collaborations and prospects.

EXPERIMENTING IN LEARNING FOR FUTURE(S) IMAGINATION

BY PoliMI FUEL4DESIGN

SOURCE: Designing in Transitional Times. Design PhD Summer School. Politecnico di Milano.
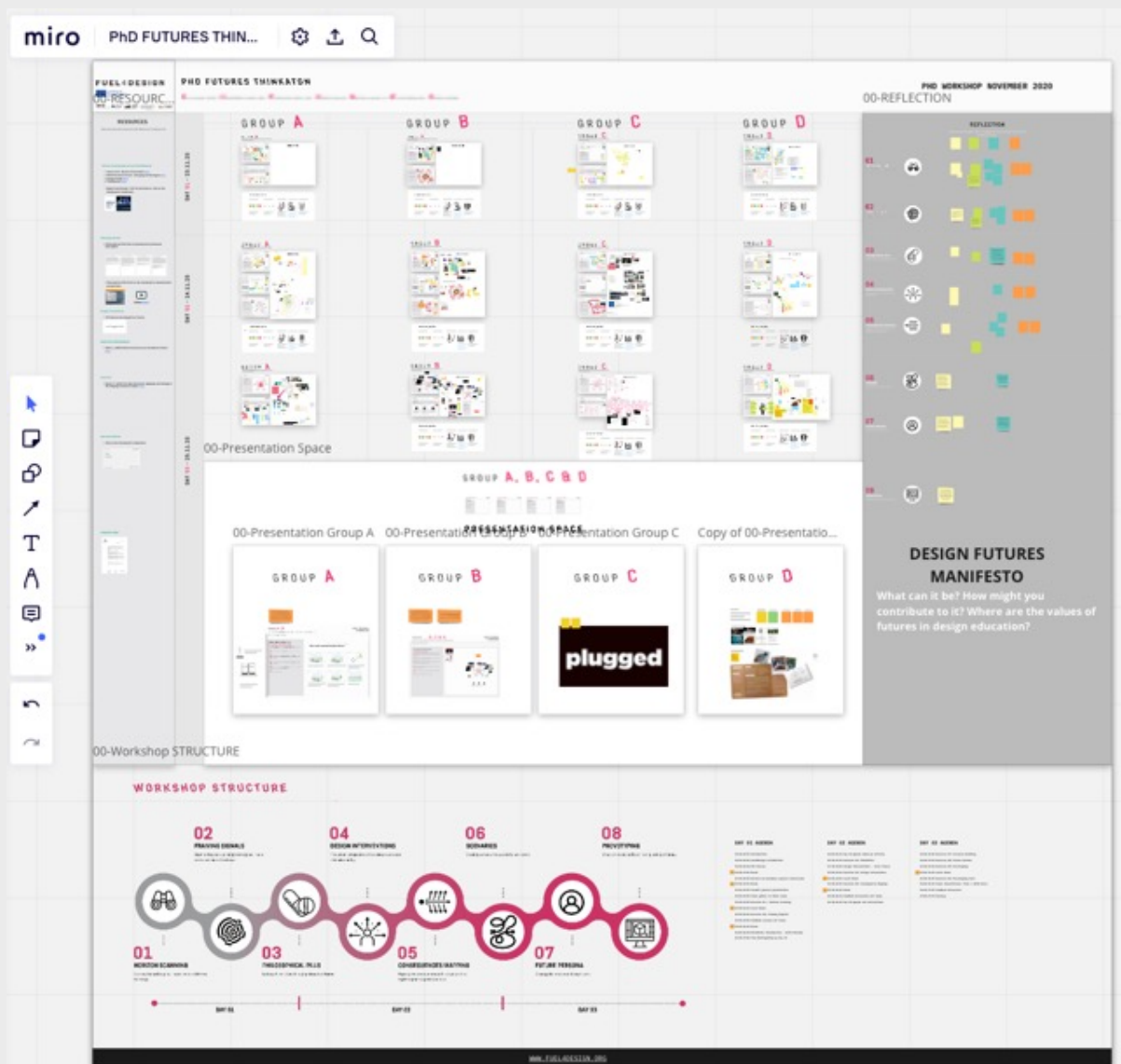
DESIGN PHD 2020 SUMMER SCHOOL

Organized by :
Design PhD Politecnico di Milano

With the support of:
PhD School of Politecnico di Milano
PhD in Design Network of Excellence
Polifactory - the Makerspace and Fablab of Politecnico di Milano

DESIGN RESEARCH PROTOTYPING COURSE

DESIGNING IN TRANSITIONAL TIMES

Experiments for future(s) imagination

THE DESIGN PHD PROGRAMME - POLITECNICO DI MILANO

APPROACH & PROCESS

From a methodological point of view, the School will propose a virtual classroom educational approach. This approach aims to enable open knowledge dynamics, through practices of peer-to-peer exchange and sharing. Part of the goal is to rethink the educator's role, which should not be intended anymore as a *master* (in the classical sense), but rather as a *mentor*, a guide into the intricate art of heuristics. This approach is particularly relevant today, as the quantity of knowledge exceeds the individual capability of mastering it and therefore a critical attitude becomes a necessary tool to address complexity.

The School will deal with:

1. Imagining the *Post Covid transition*: which epistemologies and ontologies might open new perspectives?

2. A collective reimagination of systems, as always dynamic and transitional, rather than static and fixed, as is often assumed;

3. An intellectual exploration which discusses through experiences, protagonists, ideas (eg. using Gigamaps /SOD), the connections between the emergency challenges and the contribution of the disciplinary perspective;

4. Peer-to-peer dialogues on what might be defined as *future oriented transition*;

5. A *Future Cone exercise* applied to some chosen areas of transformation (human responsibility on the world ecosystems, future of work, transformation of welfare, future of urban development);

6. What if it was my research? How to apply the exercise and the group learning outcome to each individual research;

7. A final delayed presentation with the sum up of the group exploration and personal focus and possible directions for further exploration and development.

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Stefano Maffei, PhD, Full Professor, Department of Design, Politecnico di Milano
Chiara Colombi, PhD, Associate Professor, Department of Design, Politecnico di Milano
Jonathan Chapman, PhD, Full Professor, Director of Doctoral Studies, Carnegie Mellon

KEYNOTE SPEAKERS

Arturo Escobar, Distinguished Professor of Anthropology Emeritus, University of North Carolina, Chapel Hill [USA]

Betti Marenko, Reader in Design and Techno-Digital Futures, University of the Arts London [UK] - Contextual Studies Programme Leader, BA (Hons.) Product Design. Central Saint Martins, University of the Arts London [UK] - WRHI Specially Appointed Professor, Tokyo Institute of Technology [Japan]

Laura Forlano, Associate Professor of Design, Institute of Design - Illinois Institute of Technology, Chicago [USA]

Juha Leppänen, Chief Executive, Demos Helsinki, Helsinki [Finland]

Chiara Saraceno, Former Professor of Sociology - Emerita at the Wissenschaftszentrum Berlin für Sozialforschung - Member of the "Carlo F. Dondena" Centre for Research on Social Dynamics, Milan [Italy] - Honorary fellow at The Collegio Carlo Alberto, Turin [Italy]

In all of this, we have been in a shared time of design teaching, learning and researching. Time is central to how we perceive and conceive of our futures and how design engages with the encounter of the pandemic and encounters ongoing demands of pandemic consequences pose, along with ones of climate change and climate justice. We may be in the same time and have been through similar times.

Yet, we need to also see time as plural. We need to acknowledge that different students and staff are currently working with diverse experiences and daily practices concerning time. Educationally and in research terms where design works with people and change, social justice and innovation techniques and policies, a bureaucratic return to a temporal 'normal' assumed as 'normal times', not only lexically but structurally obscures what is needed in rethinking the transformations that took place in our pedagogies in the face of the pandemic but also ones that continue to be needed to engage critically and urgently with wider responses to strategies and calls for sustainability.

There is need for what we call a pedagogical pluperfect designerly intervention in response to the 'return to normal' as organisational psychologists might have advised us: had we paused, had we contemplated, had we reflected on what might and ought to be done differently we might have anticipated our pedagogical design futures differently. Have design universities done this adequately, or at all in some cases? Have we genuinely looked at what a crisis, a pandemic and an enormous outpouring of ingenuity and responses to need have generated? In not taking a more designerly look into these features, developments and dynamics and their implications for deeper structural and pedagogical change might we by default is deflecting collective and individual knowledge to the cost of at least design anticipatory pedagogical change and potentially far wider societal positioning and likely need for engagement societally, in the present, near and longer-term future.

In these temporally entangled contexts and experiences, there is great pressure to act and to do so urgently. This can all to easily be to repeat and repair educationally what we are doing. It can also centre on active choices to revise and replace it, and variations of these. However, these too may be jeopardised by new mutations of the COVID 19 virus mutations, and our work may again be beset by turbulence or at best softer, hybrid version, than earlier in the pandemic (see also Pokhrel & Chhetri, 2021). Either way, we need to anticipate how we will work with time in our pedagogies. This we need to do in the precariousness of a disappearing window of opportunity to avert climate change.

Time is thus compressed, urgent and pressured if we are to teach and make and assess and propose generative visions and activities and the time needed for them to take shape. We will need to more strategically factor in working in time, with time and on time with each other to be able as design universities to continue to contribute to meaningful and lasting options and pathways. Our colleague Prof Håkan Edeholt (Institute for Design, AHO) observed in conversation that 'We need to realise supporting our students as good designers will look different to today and to think about what design qualities they need to have in in the near and long-term future world, not the ones we have today and not ten years ago.'

In all of this, how are we to teach and learn and not become distracted and misdirected from such important needs and goals? If we do not have the time with which to think, design and act responsibly within the disappearing window of time then we will have designed away the pedagogical potential that we seek to instil in our graduates. An additional contradiction is that we might be trying to secure commitments to deep change while re-engaging in face-to-face teaching and learning (that may be being reinstated without critical alterations or reflections on what we have learned in the pandemic). Developing design temporal pedagogies and their designing might well be one of the more urgent matters in rethinking and altering our curricula and our pedagogical practices.

2) Organisational contexts - Civic agendas

By Silke Lange & Andrew Morrison

Tension: Conflicting and compounding demands of navigating a higher education environment that requires economic growth to create more just institutions while supporting design knowledge exchange and pedagogies attending to the collective shaping of civic practices of future care.

Anticipation and political-cultural economies

In reflecting on our own experiences as educators and students and their wider institutional contextual frames and practices concerning futures design pedagogies, we have needed to reconsider relationships and emergent relations as well as contradictions between underlying models and political economies of higher education and the cultural and creative industries sector. We have also been absorbed and even repelled by the demands placed on us all to adapt and to innovate as participants in the frontline of learning in the very contexts of learning itself being reconfigured globally and locally where access to resources, technologies and support have varied considerably.

Despite having an important role to play, the cultural and creative industries are among the most effected by the pandemic, resulting in a very challenging employment landscape for creative graduates. Over the last few years, in the UK, for example, we have witnessed significant changes in Creative Higher Education, specifically for practice-based subjects which have suffered from restricted access to resources and facilities. Inequalities of access to opportunities, digital poverty and ongoing insecurities across the cultural and creative industries workforce have heightened the need to tackle issues of social and racial justice in the curriculum, as well as the wider learning environment. Opportunities for critical, ethical and socially engaged debates, as well as listening to students' narratives of their experience of making and engaging in creative processes are key to the discovery and development of new practices.

In addition, the Covid-19 pandemic has further problematised the sector, on the one hand, revealing its vulnerability and underlying inequalities whilst, on the other hand, demonstrating levels of agility and innovation in the face of lockdowns and economic crisis (Travkina & Sacco, 2020). Britain's current government, for example, does not see

the value of arts and humanities education and describes degree courses in these areas as not economically worthwhile. It is worrying that the broader economic, social, cultural and transformative contribution, that an art and design education makes, goes unrecognised in this political landscape.

However, as DiSalvo (2022) argues, in conclusion, to his most recent book Design as Democracy, it is possible to conceive of and practise alternatives to predominant institutional formations and forces as design is always engaged in acts of making. These acts may be understood at a different scale of delicacy and depth where attention is directed to the dynamics of civic, democratic and participative endeavours and experiments in caring for collective futures. However, in these experiments and pursuits, in our view there is also a need to embody and enact practices that are connected and circulated as part of ongoing transformations of what a futures design take on design education futures might become, organisationally, into the creative and cultural industries sectors and as part of ongoing engagements in forging futures between design and democracy. This may read somewhat programmatic in tone and intent, but it is of crucial importance at a time when repressive, autocratic policies and national politics across the globe are increasing and civic organisations and democratic change processes are being undermined, curtailed and banned.

Shaping civic agendas

One of the key roles of HEIs is to prepare students and to develop research that creates means and mechanisms for the promotion of active citizenship and democracy. Just a brief glance at our personal and societal experiences of Service Design views on governmental and public health responses to the pandemic, and to the responses of citizens, throws this into sharp relief. Futures design literacies cannot not but be about building spaces of shared purpose and ones where diverse needs and views need to be considered. It is undeniable that the pandemic has revealed that educators - as with health professionals as frontline workers, planners and policy-makers - need to continue to build progressive platforms, spaces, policies, processes and politics to shape practices of care and thereby solidarity.

Knowledge exchange is central to the dynamic character and societal reach of design education institutions as contributors to the ongoing making of shared democratic futures. This is a mode of design knowledge that is centred on the connection of diverse expertise that is developed and practised in contexts of its making and uses. It is grown through dialogue and situated ways of knowing that emerged, are distributed and flourish to generate design cultural capital within wider political economies of the making and selective circulation of knowledge in HEI institutions. If design schools are to further maintain and critically champion their specialist knowledge and expertise, they will need to work closely within their domain areas and between and beyond them and in concert with other similar partners and players, organisationally. We will need to strengthen our design communities of anticipatory practice and their civic agendas for more just futures. In terms of design futures pedagogies, this will demand fresh ideas, critiques of existing methods and tools, as well as a large measure of humility towards

our own innovative capacities and generations, insights and awareness. In short, we will need to address our own organisationally civic design futures literacies more explicitly. This may challenge us to accept working with added vulnerability and uncertainty while moving into new relations of agenda building that may arise through negotiating interdependencies while developing different patterns and practices of anticipatory pedagogical and research collaboration.

As Potter (2020) elaborates, we have agency and potential to continue to enact and investigate our lived experiences of the digital that may be conceptualised and practised as a site for social and pedagogical activism. As Biesta (2010) argued earlier, this will also entail attention to shifts between evidence-based and value-based education and focus away from the technology itself towards sharing of our experiments, experiences and articulations of them as part of wider co-ecologies of design learning when teacher and students have been jettisoned into online pedagogies together, differently but equally needing contributions and responsivities of care, creativity and criticality.

One key direction here, made even more apparent by the chasm of health provision globally between richer and poorer nations concerning the pandemic, is that of decolonising design education. For us this is a major part of altering our design pedagogies to meet real world futures in the present. It is a crucial aspect of an EU-funded project into design futures literacies, located in Europe and mediated in English. As Ahmed Ansari (2021) stated during a conference keynote: 'Decolonisation entails not only serious political commitments but epistemological ones: one has to engage with the colonial and precolonial past in order to arrive at a more nuanced and critical understanding of the present.'

The tension between organisational contexts and civic and collaborative partnerships and alliances has been highlighted by the Black Lives Matter movement and wider initiatives to counter racist and sexist institutional practices and legacies with countermoves and actions that are present and dynamic parts of design universities. These are ones that assert the roles and values of intersectionality, diversity and equity in addressing structural changes in how we build our expert knowledge differently to assumed western dominant modes of knowing and being. Underway are changes to our framings and enactments of design pedagogies that recognise and instil in students' pride and respect for the significance of Indigenous Knowledge systems and their long practices together with postcolonial philosophical, cultural and design experience, discourses and importantly networks.

Towards an anticipatory design civics of care

These changing features of design pedagogies – around climate and uncertainty, pandemic and altered modes of teaching and learning, and concerned with representativity, participation and voice – point to a deeper need to develop further an ethics of pedagogical care in design. This asks that we look beyond our prior framings of literacies and whose interests and world views they may have ensconced and for whom they were articulated and reproduced.

Developing sets of design-based skills capacities, acontextual and assumed to be preparatory resource for any eventuality, is unfeasible. At one level, it positions a focus on the skills of the designer as partly fixed or universal, while needing to be constantly adapted to changing contexts and to reaching beyond the challenges of immediate needs or vested interests. As has been central to design education for over a century, design educators will necessarily need to equip students with the means, resources and capacities to work in emerging, future and as yet uncharted territories and unfolding processes and with new participants.

To some extent our graduates will need to work in designerly ways as they engage in societal issues and changing contexts of work, research and life. This is about building civic awareness and responsible futures design for a 'civics of care' [→ SEE FEATURE 7]. However, there is a tension in this in that such a view presupposes that design educators somehow have a potent and intact set of design-specific tools and methods and support for creative making. In short, we will design our educational way out of future challenges by designing our way in at a skills and generic design competencies level.

At another and more reflexive and critical level of anticipatory design pedagogies, we will always meet a future that is fleeting, intangible and plural and hard to grasp and to work with organisationally and in the situated contexts and needs of participants and stakeholders. What we see for FUEL4DESIGN is needed attention to an interconnected mixing of design futures literacies as competencies fluencies and vibrancies. We need to reconceptualise the futures aspects of capacities, skills and competencies to include the competencies to work with a plurality of futures and futures-oriented tools and methods. To alter our design pedagogies to actually and effectively and imaginatively change givens into alternatives, as it were, we need to extend a futures thick approach to tools and methods to include facilitating and exploring the 'designerly fluencies' in working with futures, via materials, communicatively and mediationally.

Design educators, at master's and doctoral levels, need to work with projects at these levels in which students and teachers also look into and provide critical reflections on projects that are able to work in more anticipatory modes of expression and articulation. This ought to include attention to how time is used, in what futures view and in which scope and scaling for the near to far-flung future is being proposed and projected, and above all how such fluency demands arrivals back in the present, and shapes diverse, multiple and contrasting offerings into ways to indeed work and learn forward. In design universities, such fluency is not possible without attending to structural and infrastructural organisational change processes, ranging from strategic staffing priorities to individual motivational pathways and incentives for recognition for futures design pedagogical innovations, to mention a few only.

In the broad project of design futures education transformation and in the project FUEL4DESIGN on futures in design literacies, engagement and the generation of wider influence and impact as central matters of concern and of care. We have termed these 'vibrancies'. This encapsulates the contributions and diversities, energies and dynamics,

participation and exchanges that are made material and generate the member resources and communities of design futures pedagogies and practices needed to actively develop the imaginative and to locate it back in the present, not forgetting our legacies and their constraints or potentials. Ongoing design education will need to work with these elements even more actively as our funders require responsible, adaptive and communicatively clear manifestations of outcomes. They will also need to be framed in relation to the wider societal calls and strategic decisions, stances and programmes we have committed to as higher education teaching with research institutions.

Beyond binaries

In opening out our design schools to reconceptualising and reconfiguring our framing and practices of design futures literacies, there lies a major contradiction: making deep changes in our curricula and support for design graduates oriented towards work and research is all but impossible to do within the current systems in play as they are not designed to bear, enable or be entrusted to enact and instil the deep changes needed. Design schools are already deeply engaged in working with futures and change, from circular economies and matters of reuse and mitigation feedback by participants to reduce climate effects.

However, as educational institution, in teaching and in research, as well as with partners to these, we need to more patently and collectively address and acknowledge the underlying world views of the systems within which such designerly responses and actions occur. This extends to their emergent discourses and vocabularies, their invested and invented methods and deeper - and perhaps unseen and underdiscussed - reproductive logics. Not doing so will undermine the futures design futures education, that is in times ahead, and as a pedagogy that takes care ahead of time in its use of futures concepts, methods and materialisations in and through design.

In these pursuits and the types of reflexive awareness and anticipatory criticality entailed, there is a serious need for design pedagogies to continue to work with shifts from nonbinary approaches to subjectivity and agency on posthumanist perspectives on inter-relations between human and non-human actors. This too is to enact a wider civic practice of care. Here too we may have to rethink our notions and practices of whose time, as non-human systems and modes of 'growth' and paths to ensuring ecological flourishing, that demand different temporal support and security to for example, the voracious self-consuming 'logic' of fast fashion.

3) Experimentation-Articulation

By Andrew Morrison & Silke Lange

> *Tension: Design pandemic pedagogies generated volumes of online experience and resourcing, including informal ones, yet experiments and articulations of them may be disregarded by reinstating uncritical returns to 'normal'.*

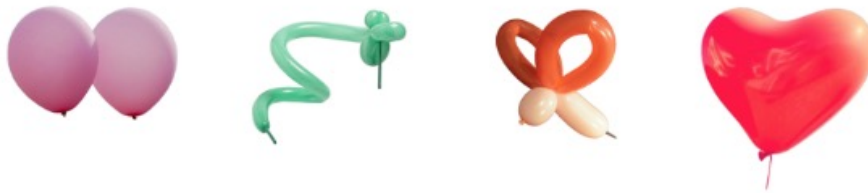# REFLECTING ON CONNECTING TERMS, WORLD VIEWS AND FUTURES

BY AHO FUEL4DESIGN

AVAILABLE: Link ↗

Online BALLUSION – Supporting Master's students in Service Design

By Palak Dudani | 01/12/2020 | Design Futures Lexicon

'BALLUSION is a made up word to create a design futures metaphor. It conjoins Balloon and Illusion. The future may be inflated, or expanded. The future may be a faction or an illusion. It may be a mix of these.' The workshop drew on a device in the LEXICON called BALLUSION designed to help master's level design students to look more closely at the role of language in their design project, big or small, and its relation to futures.

On the role of language in a futures design project, Master's Workshop #1. BALLUSION Zoom, 27 March 2020
Workshop facilitators: Andrew Morrison and Palak Dudani

This workshop was carried out online with Master's students within AHO's Service Design 2 course with Associate Professor Josina Vink of the Institute for Design just after the lockdown in 2020. The Service Design Master's students were working on a healthcare project, with focus on service ecosystems.

How might such students work with an activity like BALLUSION and relate its affordances for futures learning to their ongoing design project?

In this blogpost, we will take you through the process and reflections of a student participant at the workshop. We conducted this workshop using google document templates with embedded links and now go through its workings in a set of number moves.

1. Focus on your project

The workshop began with a short activity asking master's students to think about their current project and its relation to the future. They were asked to place it in time (near/ far off/ remote) and write 3 lines describing the project.

1. Focus on your project

The workshop began with a short activity asking master's students to think about their current project and its relation to the future. They were asked to place it in time (near/ far off/ remote) and write 3 lines describing the project.

Student reflection on prompt 1: 'Balloon & The project'

The student reflected on this saying "The project is in the future…It's controlling or balancing the air pressure inside the healthcare system that threatens to collapse. At first, it stretches the balloon a bit, but as time progresses the project becomes a balancing agent."

2. Design words for the future

The second prompt of the workshop asked students to read the 50 FUTURES DESIGN WORDS (words only). From this list, each student was pre-assigned a group of random words which they had to relate to their project. Once students got a sense of how to make connections with the words, they chose new 10 words from the list which were most relevant for their project (some may be the same words).
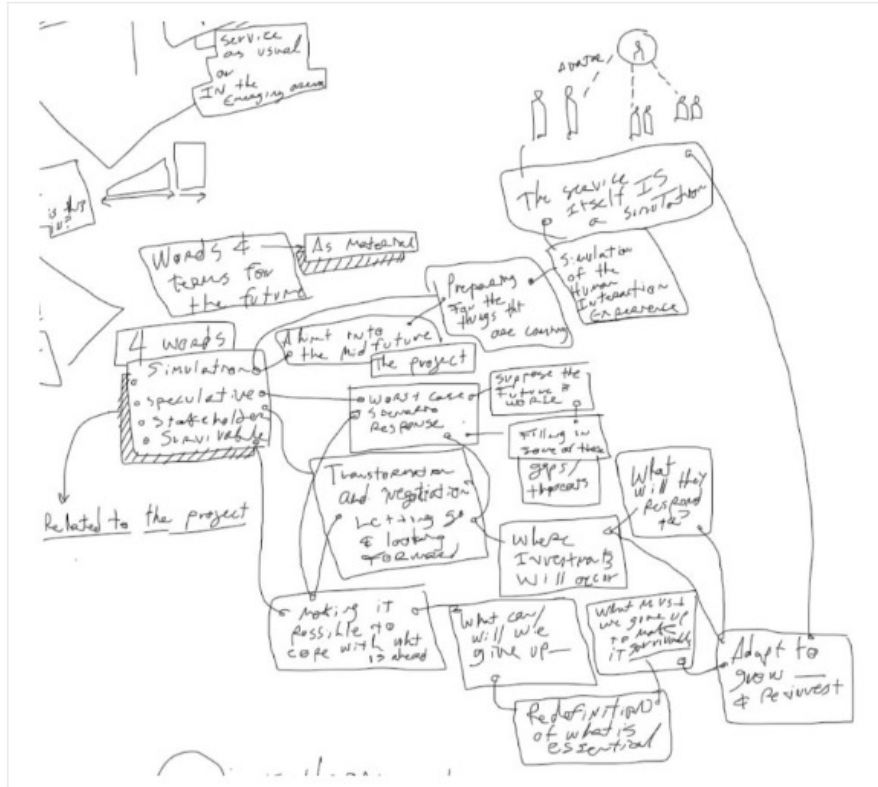
Student reflection on prompt 2: 'Relating given words to the context'

3. Inflating the balloon

The students were asked to imagine that they have a balloon where they can put their chosen 10 words and inflate it. They mentally tied a knot.

4. Back from the future

The students mentally popped the balloon, the words that can be used to describe and choose in the project they're working on? S back to their project/course/discipline. Ho propel your project into the future?

5. Write the future more clearly

As the third and final prompt, students wer earlier and rewrite it including their 5 chose
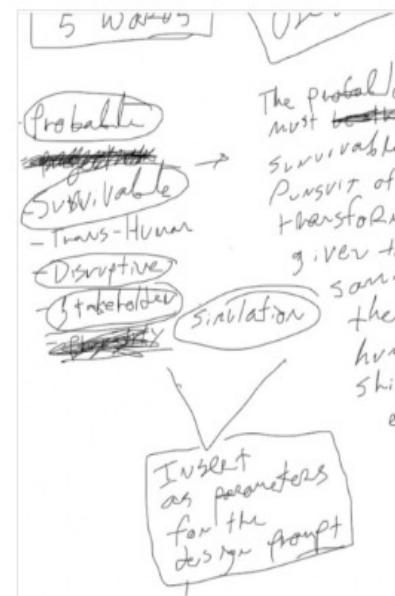
Student reflection on prompt 3: 'Use th

, releasing the words back into the present. These are
d define the future. Which of 10 words would they
Students selected 5 such words and related them
w are the words that work to prompt, project or even

e asked to look at the description they had written
en words.

e words to rewrite the project in a future scenario'

The student writes:

> *The probable future of healthcare services must enable a survivable condition. In the pursuit of that condition, disruptive transformations must take place, given the availability and somber conditions of the planet and the threat to human life. As part of these shifts, the release of certain expectations must occur to enable survival. A service experience based on simulation of face-to-face experience is crucial to make the transformation tolerable. Stakeholders must make the proper investment to enable this from NOW.*

Having been through the whole workshop, the student summerises their reflections:

> *Working with the words helped in scoping a futures-noticing point of view and anchoring it to a framework that sparks discussion and ideation around it. As well as noticing important prompts – such as 'simulation'- to take into account in the next part of our work. Simulation was a particularly useful word for me because it is related to the things the remote services must try to emulate in the future – where technology will be ever more present, but not necessarily the human touch.*

Of course we wondered if this activity had supported not only the needs of the Service Design students but also the motivations of their teacher. Here's what educator and researcher Assoc.Prof. Josina Vink commented afterwards:

> *… thank you for stimulating some good thinking about the vocabulary we are using to talk about the future. I think it helped provoke some much needed discussion about our common language as we move into the second phase of this project. The activities were incredibly useful.*
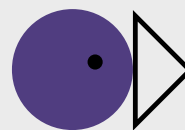
Design pandemic tools and platforms

FUEL4DESIGN has been in a rather special position in its project life in that its main pedagogical practices and project plans needed to shift into online learning and facilitation and both attempt to secure fundamental of designerly education while adjusting to a changing global public health crisis and the educational needs and support of students and staff. This macro level tension has placed our socio-material practices into relief, as it were, when there seemed to be no relief from screen-based interactions and remote learning dynamics that demanded new dedicated and intensive mediation of pedagogies and 'production-based learning' beyond notions of media literacies (Buckingham, 2003; Buckingham, 2006).

From a design pedagogies view, there are spatial practices and rhetorics in the use of Zoom and Teams and Miro boards, amongst others). These tools and platforms have themselves been discussed in terms of their interactional usability. Zoom, for example, emerged as a pervasive marker and mediator of online pandemic pedagogies in contrast to earlier e-learning's preoccupations with Learning Management Systems (LMS) platforms, such Moodle. Zoom offered educators and students across the globe with online participation that is scripted through the communicative affordances of the tool and platform. However, it is also a medium that may be repurposed and tweaked to articulate different purposes. In 'Zoom Obscura', Elsden et al. (2022), referencing the dynamics of the earlier camera obscura as a tool, position Zoom within an art-based engagement in 'a counterfunctional design for video-conferencing'. They identified:

> *… five counterfunctional strategies that were particularly fruitful in the context of Zoom, and could be extended considerably through future work. These include: a) reducing one's visibility within a meeting b) resisting the boundaries of a Zoom 'window'; c) countering the centrality of the face; d) switching off certain features entirely; and e) introducing new temporalities within a Zoom meeting. (Elsden et al., 2022: 16).*

Zoom obscura exposed and defamiliarised features such as gaze, surveillance, presentation tactics and lurking and hovering, all common to earlier online communication. They are pervasive to mainstream distributed digital design pedagogy but design uses and projects have not reported much on playing with and against the tool, and medium has become in ways this art project played with digital pandemic materiality.

In terms of design futures literacies, Zoom propelled us into not only video compression and talking heads, chat practices and turn taking and display strategies, already established in e-learning practices, discourses and research. It also scaled this up for all of us, technically and performatively: locally, in courses, institutes, universities and globally in a systemic sense and via networks and distributed, temporal and shared open access and invitation-only events and strategies for supporting learning. FUEL4DESIGN itself needed to take up and experiment with these devices in its own work (SEE the Miro boards shown above the blogposts included in this book and the project FUEL4DESIGN website and Essay 7: Learning Design by Making Futures).

Miro too became a dominant tool in design online and remains to be studied more closely as to its various and alternative uses as a digital design spatial-material and platform. However, we have heard numerous researchers and participants comment that Miro all to easily perpetuating sticky note uses as a mode of surface mark up without related deeper systemic and structural analysis, despite diverse affordances (paper, size, shape, colour and stickiness) they may offer in learning (e.g. Ball et al., 2021). Here time is also a factor in how Miro boards are 'populated' by multiple media types that may be linked to other online and digital resources and content. In terms of digital tools and platforms, Ball et al. (2021) distinguish between paper based uses of sticky notes as being an early part of ideation with digital ones being more flexible in dynamic uses on digital boards. They suggest that, acknowledging visual and diagrammatic qualities, part-whole relations, tangibility and talk centred mediations that explore:

> *... limitations of physical sticky notes and the potentially superior affordances (as well as unique limitations) of digitally infused sticky notes represents an important direction for future design research. More generally, there is a need for design research to trace sticky-note usage across physical, social, cultural and temporal contexts to explore fully the 'social life of sticky notes'. (Ball, et al., 2022: 23).*

In survey-based research from Australia, Fleischman (2020) talks about how the Covid-forced transition online meant that design educators needed to engage far more intensively in digital spaces and Learning Management Systems (LMSes) than had previously been the case. She found that students approved of the convenience and speed of use but disliked matters of motivation and social isolation. Many of the findings align with the ones we have had ourselves and that have been voiced in shared meetings and open discussions amongst educators, at our institutions. Fleishman (2020) provides a fairly comprehensive list of items on the pivot to online learning in the pandemic and issues raised by students and educators that may be taken up more fully in design learning futures as we negotiate digital-physical studios, flipped classrooms, blended and hybrid learning and opportunities to reconfigure our curricula as design continues to face matters of access to technologies, funding cuts and design education being reframed within changing societal, environmental and planetary needs.

Design futures literacies have become increasingly digital for us all. There is need to closely examine our emergent and performative practices the tools and platforms we have taken up and tried out in our pandemic pedagogies and these migrate, change or diminish in the tensions of characterisations and promotions of a 'new normal'. This needs time and energy, both of which are also stressed by 'returns' to on-site studio teaching and learning and all the embodied and haptic dynamics it brings to designers.

Design curiosity, learning and third spaces

In reflecting on the very demanding, dense and engaged uses of online tools and platforms in the pandemic, from work in digital media, culture and education (Potter & McDougall, 2017) we may benefit from looking further into what and where our students (and teachers) are accessing, becoming involved in and contributing to in terms of off-course and what we term 'self-engaged learning' (not only self-directed learning).

For Potter and McDougall (2017: 21) the notion of a 'third space', (borrowing from work in subaltern/postcolonial studies by Homi Babha) refers to '… a space which is a negotiated and contested area in which meanings are made and shared, some of which may relate to encountering new knowledge, learning or developing new skills and dispositions'. In physical terms it can be an out-of-school venue or activity. It may also be 'a metaphorical location in which the learning is negotiated through agentive activity on the part of both learner and teacher …'.

During the pandemic, design students and teachers have what largely personal and uncharted practices of using of online and mobile media, information and content-related resources, including participation in informal groups and events that may have direct and indirect bearing on their design work and projects [→ SEE **FEATURE 8**]. As activities, these have been sites of expanded negotiations of the prior curriculum and learning resources and personal content and skills strategies. Whiles access to course-related online venues and events has been a key feature of 21st century disciplinary and transdisciplinary design education, 'lockdown' saw an extension of energies into informational and mediational online encounters. This may have connected with new knowledge whether in individual searches and garnering of information and content related to a course or a specific project need or a wider and related interest.

Joining additional online courses, seminars and importantly open platform discussions also featured and indicates the emergence of not only formal needs and skills development perspectives, but the importance of motivation and the augmentation of interests and use by way of online uses of time, in home offices and on digital screens. Students and staff have joined new courses and taken part in online discussions that have extended earlier themes and directions in design inquiry via attention to shared professional and research practices. They have also included the amplification of such interests and the generation of new, even counter, pedagogical resource building and sharing.

Our digital tools affect and change us and our teaching and learning; we are also active designerly agents in making them work and directing them and picking up and recombining their affordances and limitations and facing controversies in critical views on the digital in pandemic education (Williamson, 2021). Here locating, selecting applying online resources is crucial. Controversies expose power relations and practices, and if we are critically, pedagogically and investigatively agile, as Williamson et al. (2021: 119) write about research on the digital education, we:

> *… should also now carefully scrutinize proposals for long-term digital transformation— teasing out their animating imaginaries, their networks of support, the longer histories of thinking they draw on, their funding, the practical actions they catalyse in the present, and their implications for education over the next decade and beyond.*

There are longer-term futures for our pandemic pedagogies as contributors to our hybrid design futures literacies, learning and related research.

DESIGN FUTURES SCOUTING: IST PERSON PERSPECTIVE (ELISAVA)

BY I03 team (ELISAVA)

Augmentation of personal activities   +

Learning something new   −

This activity is intended to experience what it means to expand the participants' skilful actions.

*Prompt: Learn something that will be required to know in the future of the project you are developing, and reflect on the opportunities it creates.*

Video: Pablo Zuloaga, Master in Design for Emergent Futures, 19/20

Pablo learned how to program sensors to measure humidity and the PH of soil. He did it to experience the difficulties that a non expert can encounter. At the same time it allowed him to explore the opportunities that digital sensing technologies can bring to farmers in the future.

Figure 1: Pablo Zuloaga's First Person Perspective (1PP) design intervention on learning how to program humidity sensors. Master's in Design for Emergent Futures (ELISAVA, IAAC).

6.
WIDER SCOPES, SPECIFIC VIEWS

BY Andrew Morrison & Silke Lange
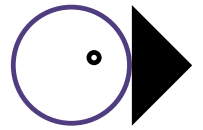
Entanglements: digital, physcial and hybrid

An underlying tension has prevailed as we faced the pandemic, during it and now in 2022 as we write this text. It is how we are to map out and work in connected ways to draw on digital resources and online experiences in shaping pedagogies that have become infused with digital content, devices and interactions. They have been deeply critical and are about new relations and knowledge frames that are not fully processed or reflected on as the demands of the physicality of day-to-day teaching unfolds. Writing in May 2022, we experience - and must work with - pressures and assumption of the 'new normal' (see also Mareis & Maim, 2021). However, there is a potential (and some might argue pervasive) naturalising away of the tensions and contradictions in designing that pandemic pedagogies have exposed as well as what pandemic pedagogies may more fully contribute to design futures literacies in postnormal times.

Counternarratives have been brought more challengingly we would argue into the core of our work, if not always explicitly discussed by engaging with Design Futures Literacies in the context of crisis. We have needed to support a range of needs, learning style and adaptations as our students. Our own work has navigated and negotiated the pervasive force of digitally mediated design learning. We have needed to conceptualise and enact responses, if not always policies, that acknowledge and respect not only diversity but difference, key arguments, assertions and international discussions brought forth through elaborations of topics, programmes and strategies for decolonising design (see also Final Chapter). We are still negotiating, and will most like continue to do so, in ongoing work on exploring and realising the socio-material practices of performing design future literacies. These will demand of us sensitivity and flexibility in how we shift between the digital, physical and hybrid modes of learning, designing, researching and communicating. Marenko (2021) has argued that we need to reframe view on uncertainty by way of enacting hybrid literacies and 'stacking complexities'.

In an editorial to a special issue of Design and Technology Education entitled 'Design education: Teaching in crisis', Jones and Lotz (2021) summarise eight main lessons from contributors that we see as pertinent. These are: 1) You can't just translate the 'surfaces' of one mode to another: 2) Who gets to speak - who takes part; 3) Connections, not proximities, matter regardless of mode of teaching; 4) Studio depends on habits of practice - but is also adaptable and changeable; 5) New words to describe and conceptualise in-between experiences; 6) New opportunities beyond 'normal' boundaries; and 7) we all need support; and, 8) making things visible.

Reflecting on design pandemic and futures pedagogies

Pandemic pedagogy solicits innovations and experimentations, playful engagement and intellectual risk-taking, and stepping out of the comfort zones into the context of everyday life. It is a practice for making our practices of teaching and learning, more ontologically situated (Pathak, 2022: 65). Yet, in 'Covid-19 controversies and critical research in digital education', Williamson et al. (2021:1 99) argue that 'Drawing attention to controversies in education technology can likewise assist us in understanding how certain futures are being opened up or foreclosed as debates intensify over the post-pandemic future of education'. They address this in terms of the following main categories (that apply equally to design futures literacies and pedagogies). These are: the delegation of state responsibility and uptake of needs by companies, inequality in ed-tech provision and access, the need for support as to continuity and care, the rights of students generally and digitally, mapping and mitigating 'learning loss', and developing policies and future critical research on post-pandemic digital education.

Pedagogical leadership, strategic investment and coordinated responses have been thrown up as demanding attention and reassessment. They will need anticipatory attention if we are to forestall and mitigate some of the constraints and debilitating effects of learning in crisis and the continued and future force of uncertainty and emergent challenges, whether under a different future pandemic or concurrent, overlapping, compacted or compounded crises, whether financial, geopolitical or climatic. One of the key issues is whether design schools will actively design such futures design learning as a space for design and transformation or shy away from the many difficulties we have not only faced but cannot but admit and alter if we are to reach beyond the conceptual and policy frames and human practices and pedagogies that have contributed to our current complexities. While a compound of a pandemic and other crises has surfaced many matters we might address differently in our teaching and learning, their systematically effective alternatives will require us to engage as a sector and perhaps take a more serious and concerted reckoning about what we might and can and ought to do to design education. Perhaps one route is to open out to a wider networked 21st century relational shaping by way of anticipatory design pedagogies and design futures literacies. These would be far more elaborate, collaborative and distributed that our one project has offered.

Design and digital design tools and technologies have been essential to keeping learning alive and to supporting hope that alternative futures might be arrived at. Teachers and students alike across design schools the world over have sought to support the purposes and practices of situated and dynamic engagement in shaping challenged presents, emergent futures and design futures literacies in-the-making. Their ingenuity and survival, together with what they have experienced and may offer to prospectively changing our curricula and its societal and environmental contributions, remain a massive resource for futures in design education. Futures in design education and futures of design education will continue to need our active coordination and collaboration through which we may tap into massive, shared, varied experience to share and better develop together 21st-century design education that contributes to different, dynamic, survivable post-industrial futures.

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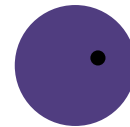
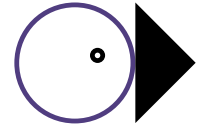# SUSTAINABILITY, SYSTEMS AND LEARNING DESIGN FUTURES

BY Andrew Morrison, Corbin Raymond & Palak Dudani

WITH Yue Zou, Manuela Celi & Hayley Fitzpatrick

1. INTRODUCTION

BY Andrew Morrison, Corbin Raymond & Palak Dudani

On systems and sustainability

A clear marker of contemporary societies and an Anthropocenic planet is the multiplication and co-occurrence of attention to sustainability and recognition of complexity. Complex relations between elements, participants, processes and structures has long been the interest of systems theory and studies. Part of a post-World War II drive for planning, management and geopolitical spheres of dominance and expansion, systems views were closely linked to structuralist world views and methods, extending to the growing field of futures and foresight, as well as the shift to global consumerism in design and the expansion of global financial markets. These developments impinge in many regards on today's attempts to mitigate and halt global warming and its long-term further damage on planet earth (biologically, environmentally, societally and politically). Systems views on human habitation, creativity, commerce, culture and politics are embedded in relations between nature and humans, in an evolutionary and emergent sense.

Matters of sustainability, systems ecologies that urgently demand our design creative and social innovation today echo many of the critiques and pedagogies for addressing them that were outlined over 50 years ago by Papanek (1971) in Design for the Real World: Human ecology and social change. In terms of knitting together the ecological, sustainable and systemic, Papanek's calls for radical change to western consumerist design acknowledged that design is political and shaped through situated uses, action and activism - and not only the force of corporations and profit-driven logics over people and planet (see also Kries et al., 2018). His insights and perspectives prevail today as they still apply to many of the fundamental issues of the roles and functioning of design in relation contemporary world views and political economies. They are applicable in keeping design connected to social innovation for meaningful democratic change (Clark, 2021). Concerning sustainability, Walker (2016) calls for radical reviews of design consumerist and materialist values and argues exploration of inner values, human imagination and inspiration from nature.

In this chapter we take up a number of matters that have a bearing on relations of sustainability and systems-oriented design. As just suggested, these matters are entangled in the histories, framing and practices of relations between ecology and nature, sustainability and systems inquiry (Fallan, 2019; St. Pierre, 2019). The relations between these aspects are further complicated when elements of the two are entangled with one another, and with the forces and configurations of Futures Studies and Design. This extends to approaches to social innovation, political economy and

educational change. Work for the 1960s and 1970s endures. Focus on sustainability was connected to the growth of ecological movements and 'developments studies. Over two decades ago, Walker (2006) oriented us to 'sustainability by design'.

The genesis of systems perspectives - with cybernetics and technological development positioned in relation to counter-cultural and military axes at the University of Berkely from the 1960s to the 1980s - has recently been charted by Nelson (2022). These complex relations, and their variegated 'knots' - conceptual and methodological - makes it challenging to devise and implement meaningful and futures in design-oriented anticipatory work in design pedagogies and literacies. It asks that our students also read widely about design histories for the reach and influence they have in current discourses and policies. Given these concerns, in this essay we consider and elaborate on a number of intersecting key matters:

What are the predominant and emergent perspectives on sustainability and design and on systems-oriented design and why are they framed as they are?

How have matters of sustainability and systems been framed in design-related inquiry and education?

In a futures view what might be tweaked, adapted and avoided and what might be developed and offered?

What might be some of the connections and intersectional patterning and possibilities in relating sustainability and systems design?

What might these synergistic, relational imaginaries do to bring us back to sustainable systemic action in the present for long-term survivable futures?

For whom and via what means can we build a critical, anticipatory forces around public engagement and design futuring with implications for policy and participation, and for the role of a design education in shaping such emergent and differently crafted futures?

In taking up these matters in a relational view, several issues arise right up front for working with futures literacies and design education directed into futures for planetary survival in which sustainability and systems choices and implementation are essential. These issues also have a major bearing on why, what, how, and when design education engages critically, creatively and prospectively to address them [Figure 1].

This essay, perhaps more than others, attempts a critical review of literatures and orientations on sustainability and systems approaches that are often not explicitly connected to one another and even less in terms of a relational, intersectional and transdisciplinary framing and implementation of critical-creative aspects of their importance for both future of design education and futures in design education. In addition, design social innovation collaborative discourses and anticipatory cultural design systems views remain underarticulated and offer paths for further connection, as we discuss in the latter part of the essay.

SURPRISING FUTURES DESIGN WORDS

WITH DEFINITIONS

This set of words is deliberately alternative, and more than a mouthful, in that it offers unexpected, surprising and possibly deflecting and disruptive words. The intention is that they prompt, propel and provoke you into thinking about how to define and use them, refine or replace them. The working definitions provide some sense of the concepts that are proposed.For ideas and other words to consider and combine, you may also like to see 50 FUTURES DESIGN WORDS (Words only) and 50 FUTURES DESIGN WORDS (With definitions). For larger lists see 250 FUTURES DESIGN WORDS and 450 FUTURES DESIGN WORDS.
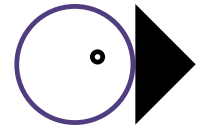
Figure 1 ▶
Collaborative
SURPRISING
FUTURES DESIGN
WORDS. Potentials
for working
with given and
generative
vocabularies
in shaping
concepts and
analysis in futures
sustainability and
systems-oriented
design. From the
DESIGN FUTURES
LEXICON 8IO19, AHO.
(Image credit:
Design, AHO).
Link ↗.

Provailable
To make available ideas and action states and processes ahead of their material realisation and use to provide resources and action-oriented potentials for effective design futuring

Re-futuring
An avoidance of historical extractive and destructive cycles of designing, work and consumption through participative, responsible, resilient and supported scalable actions that address alternative, radical and survivable local and global worlds through reflexive and accountable designing and cultural uses

Time layering
Futures designing and use is dependent on how and where specific aspect or views on the future are located temporally and in relation to one another spatially, that is by substance, distance and accessibility, so that time is not cast as linear but diffractive, relational and may be dilated and recompressed as needed

Transpositioners
Actors or participants – human and non human – who have the capacity to understand the value and potential of an idea, process or artifact and to move it to another spot or plane in a future scenario or setting thereby also shifting its character and potentialities ideally for the better

Wilding futures design
When the interplay of futures and design is explored and achieved through acts and perspectives on being that are realised emergent via unscripted emergence of ideas and processes together with abductive ecological practices

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In the next section, we outline a set of core matters concerning shaping sustainable systemic futures design education. In Section 3, we pursue these matters through addressing the need to make connections between sustainability and design and systems perspectives on design. Our fourth contribution provides an overview and discussion of paths to long-term ecological and sustainable design learning. This is followed in Section 5 that charts relations to systems, futures, design and learning, following this, in the sixth section, we take up matters of culture and systems oriented designing and political economies of design. In the seventh, concluding section we discuss and further position matters taken up across the chapter.

2 FINDING FUTURES MATTERS IN SUSTAINABLE-SYSTEMS DESIGN

BY Andrew Morrison, Corbin Raymond & Palak Dudani

Matters of shaping sustainable systemic futures design education

Nine related matters

We list nine related matters that impact on the shaping of sustainable, systemically enacted futures design education.

The first is that early work on sustainability and design is entangled in discourses, policies and practices centred around development and growth. Today, this is challenged by calls for 'degrowth' and for carbon reduction by leading Global South polluters who see this as a contradictory call by western powers who have benefitted from similar fossil-fuelled development. Calls for degrowth are linked with drives towards nurturing and resilience. In addressing matters of anticipation, sustainability and futures, Tonn (2021) reminds us that our long-term planetary survival needs to face what underpins and also may release our living systems from multiple threats of extinction.

Second, models of sustainability are thus now needed to meet challenges of design as a (post)industrial practice and to far more substantially address global and reconfigurations of a political economic order of magnitude. Lotz-Sisitka et al. (2015) argue that higher education pedagogies need to be deeply and urgently rethought in what they term 'times of systemic global disfunction'. They pitch these pedagogies as a matter of shaping social learning that is transformative and transgressive. We see the importance of futures in design learning and the futures of design learning as needing to be critically positioned in relation to discourses of sustainability and system relations both outside and within design (e.g. Ceschin & Gaziulusoy, 2016).

Third, matters of uncertainty and complexity are compounded by deep underlying infrastructural, procedural, and logistical legacies that mirror scales of change (Figure 2). Needed then is acknowledgement of the underlying and embedded systemics and procedures of existing market economics, and their dependencies on resource extraction, locations of mass production and global supply chains. Edeholt and Joseph (2022) argue that design needs to address systemic difficulties in addressing radically different change processes. This may benefit, they argue, from disciplinary cooperation that may provide us with routes to reaching beyond only design as crisis and design in crisis (Fry & Nocek, 2020) to understanding that we must tackle a 'system in crisis'.

Fourth, is a core matter of understanding the relation between the deep crisis of sustainability and the entanglement of design and political economies. This relation exceeds our immediate responses and near future visions. It requires fundamental, innovative and transformational thinking, policies, actions and experiments to shift practices and values beyond delegation to dismay and dismissal and to support programmes and pathways to actual, material transformation. A recent example is that of the collection Design and Nature: A partnership (Fletcher, et al., 2019). Earlier Burns (20159 highlighted the contributions of both ecological systems and indigenous wisdom in developing 'transformative sustainable pedagogy'. For Ruecker, et al. (2020), attending to systemic values-based mapping - covering peace, prosperity, health, empathy, respect - can help graduate students negotiate design learning and inquiry on futures by way of focus on clusters of design rather than single ones. Students gained experience in working with historical perspectives on values as well as ones connected to prototypes, in which conceptual models, the working of time, and values embedded in objects were included [Figure 2].

However, fifth, modes of learning to (un)learn are needed in such a mode of change, its transitions and the turbulences that will transpire as we learn and design and unlearn how to do this, societally and in design schools also in transition (e.g. lrwin et al., 2020). No longer will deliberative, linear and planned programmatics suffice. Dominance practices and dependency relations can only relegate such potential for survival, and responsive with response-able action, to the shadows. Students need to access design-futures research and practices, such as concerning design and emergency (Rawsthorn & Antonelli, 2022) and design and extreme events (e.g. Broska, et al., 2022).

Sixth, the dynamic, multiple and scalable character of systems have to be more fully investigated and implemented for long-lasting change to be secured: that is for it to be actually sustainable for environmental and for human survival. This is itself a sustainable anticipatory futures framing that exceeds, reaches beyond, interrupts and refashions dynamics between how human and non-human relations of biological and artificial ecologies and their actors, processes and systems. It too concerns our ethical perspectives and emergent understanding and the ways we surface and share these in contexts of ecology, technology and the Anthropocene (e.g. Chan, 2018). We need to more actively fashion and 'future craft' ethics in design education beyond skills into curious creative futures shaping (Haug, 2017). Fallan (2022) reminds us that this is an essential matter of unfolding what may be understood as ecological design, historically and in terms of cultural futures resources that need historiographic mapping and linking. These views are key to why and how we move onwards into placing ecologies of design and of learning as central to our anticipatory design pedagogies and research.

Seventh, without attending to matters of scale in a systems view, the dynamic character of how we might and need to go about securing long-term planetary sustainable futures will remain dispersed. Means to achieve such futures will also very likely be dissipated by powers interested in maintaining current advantage over new 'currencies' of change. These may be understood on three levels: 1) currencies referring to flows, dynamics and change, 2) currencies as ones that have economic and cultural value and 3) that are part of linked long-term action that is centred in the current now.

Eight, Design students, teachers, researchers and professionals all work in the thick of complex and changing ecological, societal, technical, cultural and economic challenges. The intersections and entanglement of these challenges demands care-ful and far-reaching changes in how we learn, love, work and endure in a planet threatened by our psychological and organisational choices. These choices are difficult to motivate and to ensure when the scale and needed changes in lifestyles, choices, consumption and production are themselves complex and challenge not only current comforts and assumptions but open out uncertain pathways and uncharted futures. The most recent IPPC Synthesis Report (2023) indicates that the window for making changes that may avert unstoppable, exponential climate change is now more acute than ever.

Ninth, while government policy and regulation and corporate initiatives and innovation are essential to securing futures for those who come after us, Design will be central to tackling the likely ongoing complexity and uncertainty of times ahead. Design education, and one that is fuelled by creative practice and critical research inquiries in partnerships, needs to urgently address matters of sustainability and systems-oriented design. These topics are present in many design curricula and strategic visions, however their centrality and their importance is not always placed front and centre but tackled within incremental adaptations. In part, this may be understood as a feature of a design education that is located within assumed political economic models and preferences where profit-centred relations between design education and market-driven logics prevail. It may also be a position we have arrived at, and even as a sector globally, because the alternatives are difficult, unclear and demanding.

Sustainable systemically vibrant presents for future flourishing

Below, we suggest further exploration on how the shaping of futures pathways for change between sustainability and systems-oriented design may provide us with some of the means to addressing the challenges and change processes that lie ahead, in the near- and longer-term future. For example, in a motivation and model for a whole systems design approach to sustainable design, over a decade ago, Blizzard and Klotz (2012) cautioned us that sustainability is not only about the needs of future generations but applies to an immediate world where people already experience precarious daily lives.

Linked to such a systems view, later in the chapter we also discuss matters around political economies of change and the need for integrative futures designing. These matters are not very widely discussed in contemporary design journals in terms of the futures of political economic change yet they are fundamental to further and deeper change being realised.

In response to this tension, we venture into a short marking out of some of the issues and potentials around degrowth, 'the circular economy', renewables and related questions and methods for working to enact and secure sustainable systemic integrative futures. Our stance is one of opening out these matters for discussion. We do so to indicate how hard it has been, even in our own motivated work to support systemic, sustainable learning futures. This we highlight is in large part due to that design is all too rarely deconstructed and exposed in terms of the underlying political economic foundations and corresponding Anthropocenic correlatives of its own self and collective destructive participation.
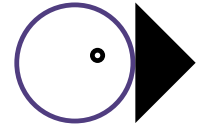
In addition to such a set of relational matters around sustainability, systems and survival, we also put forward perspectives that are located in cultural framings and practices of anticipatory designing. We do this to contribute to, but also to counter, tendencies of system-oriented design and anticipatory systems inquiry to work with abstract systems views, models and methods.

While these views have their place, they place systems as their object of analysis, too rarely discuss designing as a knowledge activity as part of systems dynamics and focus on typological modes of structuralist mapping without situating systems more fully in terms of socio-cultural knowing, learning and change, Dubberly and Pangaro (2023), offer a comprehensive schematic list of core, needed systems components and directions in futures of design education. However, while this is part of a third special issue of *She Ji* journal on design education, they do not include anticipatory perspectives of systemically drawing systems into *futures in design* teaching, learning and research. In contrast, Joseph (2019), for example, whose doctoral work is featured across this book and who has contributed to several FUEL4DESIGN events, deploys back-casting of speculative product design artifacts and related narratives to point to underlying, imminent and distant aspects of problematising and building hopeful paths for addressing matters of long-term sustainability.

3.
MAKING CONNECTIONS, WORKING THROUGH COMPLEXITY

BY Andrew Morrison

Paradoxical design futures

Unpacking complexities

In The Future of the World: Futurology, futurists, and the struggle for the post-cold war Andersson (2018: 220) observes that:

> … *it is not at all a paradox that the real interest in futurology took off at the very same moment that historians have depicted as marking the turn from the future. From the oil crises on, what had in the corporate world begun in experiments with decision games, forecasts, and scenarios as ways of improving decision-making became techniques for envisioning new and turbulent world market relationships that set a premium on the active management of expectations. Scenarios, in this context, allowed companies such as Shell to set out normative, guiding images of price movements and thereby contribute to a much desired stabilisation of world commodity markets. At the same time, forecasting also became a preferred tool of transnational organisations.*

This Cold War period experienced large-scale environmental damage from mining, industrial pollution and agri-business, fuelled by coal and oil. Societies and citizen-consumers were sold technology-driven futures centred on making work and leisure easier. This was a world propelled by approaches to planning, notions of cybernetics and a race for geo-political and military supremacy. Many of the results of today's climate crisis were embedded in competitive and command extractivist political economies of the time. Design then may be understood as a social material political economic practice that was aligned with ideologies of the post-WWII period. Increasingly, Design was manifested through focus on industrial and product development and burgeoning growth of consumer economies. This occurred in the West and in its further export of design education and design as a profession across the globe.

A further paradox that arises during this period concerns the growth of sustainability in and for the Global South that is underpinned by globalisation models and practices of western market economies. As political independence gathered forces and nation states were established so too grew forces for self-reliance and sustainability. Tensions about decolonisation arose between political assertion with deep economic structural dependency; this would play out in the sphere of influence and 'development' politics fuelled by Western and Soviet powers. Consequently, design was driven by product design linked to the expansion of markets and to the increasing appearance into

the 1980s of globalisation. Yet, in the emerging Global South calls for 'sustainable development' and self-reliance were in part driven by the export of western expertise and assumptions of increasingly neoliberal market economics, most patently in the 1980s onwards in the form of economic structural adjustment programmes. Sustainability thus became a major and contested domain of emerging economies yet at a global level these were welcomed into extractivist trade dynamics with systemic roots in remote markets and their information technologies of monetising and monitoring.

Relations between Futures Studies and Design have been characterised as being alike in their multi and transdisciplinary composition as well as both engaged with similar pursuits in the second half of the 20th century. However, that they seem to run in parallel and it is only in the past decade that more explicit connections have begun to be made, such as in experiential futures and gaming (Candy & Dunagan, 2017) and biodiversity and pollination through feminist participatory embodied design for thick presents (Jönsson, et al., 2021). In design education this has also been apparent in studies such as 'telescoping' abstract possibilities back into current pragmatics in the teaching a strategic foresight studio (Dunagan, et al., 2019) and introducing speculative design and imaginaries into a business school course on sustainability education (Acquier et al., 2021).

For Barbrook (2015), in these developments we witnessed a shift in our imaginary futures that were technologically centred, from cybernetics to the internet, and from DIY maker spaces to social media citizenship and its profit-platform logics and limitations. The growth of Interaction Design since the 1990s saw critiques of technology determinism and calls for participative and co-design alternatives. This transmorphed into the Internet of Things and, latterly, 'smart' cities and homes, and locative and social media and related 'mobile' cultural values and experiences. Critiques of techno-driven takes on design and futures concern tensions of access, participation and values often buried under 'user-friendly' features and functions through which our daily lives are altered (Kuang & Fabricant, 2019). Futures imaginaries - amplified and circulated through the web then social media - have needed to fuel their own literacies. These include appetite, participation and distributive communication as part of finding ways and modes of engagement. They do this by designing transdisciplinary and the socio material performative transformative acts of shaping futures (e.g. Light et al., 2022); [FEATURE 1].

Central to these situated, participative, speculative and shared futures shaping for action is an interest and drive to shift our cultural and participatory design imaginaries into thick presents, what Haraway (2016: 2) sees as 'a tentacular web of troubling relations that matter now'. Yet, in a relational design view, such designing is anticipatory in working to develop sustainable long-term futures. It is realised through design-situated approaches to future making in which attention is to what Tiberghien (2022) terms 'formativity'. Referring to the work of Luigi Pareyson (1988/2007), only recently translated into English (2022), Tiberghien highlights the poetics of form being realised in-the-making, and that making processes help

constitute form. This dynamic may also be understood in relation to coevolutionary design between oscillations and relations between problem spaces and solution processes (Crilly 2021a, 2021b). In an anticipatory view, such formativity applies more broadly to how we are going about a type of 'terra-forming' our shared sustainable futures and the unpacking of systemic relations behind them and through which we are manifesting their socio-political and environmental relations and practices for long-term ecological survival. This has been evident, for example, in the endeavours of the *Collaborative Future-Making* platform at Malmö University in Sweden (**Link ↗**).

Connecting design sustainable imaginaries, systems and change

With the emergence of Service Design, it has been argued, assumed models of innovation and design management driven by profit at any cost have increasingly become evident. This has been due to the exposure of underlying logics of financial service driven economics and because experiential service perspectives have matured (e.g. Matthews, 2021). For Beckert and Bronk (2018) - in contrast to predominant discourses of technologically driven innovation, social innovation and responsibility models, ethics or systems - there are systemic linkages between imaginaries and narratives and our calculations concerning uncertainties of such economic systems and economies. These have implications for behaviour and markers and makers of power. So too has the entwinement of such systems and their regulatory mechanisms and practices extended to the promulgation and surveillance of digital technologies. increasingly automated technologies have reached into our daily lives and work in many different settings (see e.g. Mager & Katzenbach, 2021).

In times of continuing, compacted and concurrent crisis at local and global levels - whether due to violent climatic events in Pakistan or unpicked U.K. fruit and shortages of food supply due to political and administrative policies and cross-border controls - it may seem gratuitous to reach beyond into design futuring as other than dystopian. For Slaughter (2004), this is to work towards hopeful approaches of social foresight. Reeves et al. (2016) suggest that what is needed is that we think of 'The future as a design problem'. Referring to ubiquitous computing, they argue in doing so greater attention be placed on social concerns and social legitimation to avoid brittleness in shaping design practice. In this practice, perspectives on futures (pragmatic projection or grand vision) are used to direct and structure design decision-making as to what could, should or should have been designed. It's also concerned with greater attention to the design of social circumstances through links between design fiction and participatory designing.

These views are emblematic of many of the core concerns in working with design and sustainability. They are also central in the emergence of Systems-Oriented Design (Sevaldson, 2022) in the past decade. Together, they may be seen as a still somewhat under-integrated opportunity and synthetic design futures practice of shaping concerns for design-centred systemic exploration (Jones, 2014) and exposure of links between complexity, sustainability, democracy and education. Design education would arguably benefit from such linked, synthetic and situated pedagogies in which a 'futures-in-design' view may assist us as design educators and organisation to develop additions to already charted 21st-century design curricula undergoing modification.

However, are designers as practitioners able to approach issues through critical reflection, or does everything becomes a 'design problem with a design solution', rather like a hammer that sees every problem as a nail? As a profession that has grown out of post-industrial age and evolved to respond to the logics of western neoliberal economies, what lenses does design see the world through? Without a reflexive engagement with its own world views and their limitations, the design professions cannot expect to frame problems and offer solutions beyond what is self-serving.

Towards systems expertise and change for sustainable futures

Regarding sustainability, most design schools are now deeply entangled in working towards design learning and design practices for more ethical, environmentally respectful and astute uses of resources, materials and systems of recirculation and regeneration. Pursuing and adapting sets of related driving principles challenge us to reconfigure our educational, professional and research practices. They demand a changing of our orientations and the implied, directed and inspirational uses and behaviours of the Product Service Systems (PSS) we design, teach, promote and research (Ceschin & Gaziulusoy, 2020). For Sevaldson (2022), drawing on numerous master's level student projects in a specifically systemic take on design, what is needed is deeper understanding of what a systemic orientation to design implies and offers (see also Jones, 2020). In Sevaldson's view, this depends on the generation and occupation by students of design rich spaces, physical and conceptual, that facilitate pragmatist systems designing and analysis in which the working of complex systems is constructed and operates and by extension may be changed.

A systemic take on design (Jones & Kijima, 2018; Egenhoefer, 2017) needs to be informed by research that takes an ontological view, not just a practice-informed view. This means, being able to unpack the 'ways of knowing' behind what we characterise as 'systemic', and the philosophical positions that different disciplines informing 'systemic design' might bring. Without engaging with the dynamics and logics of knowledge production, we risk staying with a superficial understanding of this 'systemic take on design'. For Chave (2021) such a systemic take on design concerns the making of 'spaces of appearance' to support the visible interplay of complexity and futures in addressing matters of emergence in a revision of western notions of education and rational notions of subjectivity. This is achieved by working to be active and hopeful in opening out to the stances of those of others and via attention to intersubjective first-person and first-being encounters (Chave, 2021: 181). This focus ties in with the First Person Perspective elaborated in our own work on DESIGN FUTURES SCOUTING (See Volume 1: Part II). It also points to ongoing recognition of ways of decolonising design education in which a plurality of views, and thus cultures, human and non-human actors are part of a changing relational design take on sustainability and systems of anticipatory educational futures change (SEE: Essay 1: Anticipatory Design Literacies). These are matters we have taken up in different work packages and events in the FUELDESIGN project. They are also central to the final chapter of Volume 1 entitled Learning Futures Design Otherwise.

4
TOWARD LONG-TERM ECOLOGICAL & SUSTAINABLE DESIGN

BY Andrew Morrison
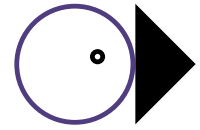
Relating transitions, supporting design change agents

Towards a poetics of relating

In Design for Sustainability: A multi-level framework from products to socio-technical systems Ceschin and Gaziulusoy (2020) present an integrative approach to a range of related fields and practices, from eco product design to design for social innovation. They label this Design for Sustainability (DfS) whose aim is to work with stakeholders long-term and large-scale transformation and design for sustainability transitions. They argue that:

> *It is required that we change the way in which needs are fulfilled and develop consumption patterns and lifestyles based on the consumption of far fewer resources. It is increasingly acknowledged that we have to urgently move towards socio-technical systems that are capable of operating within the planet's limits while ensuring that this move follows pathways that are ethical and just. (Ceschin & Gaziulusoy, 2020: 7).*

Design for sustainability has long addressed matters of environment and ecology. These concerns have been extended to intentional design (Stegall, 2006) and to ethics and practice, as addressed by Fry (2009; 2018) in editions of his book Design Futuring.

Vezzoli et al. (2014) provide an extensive positioning of studies and practices of sustainability and their development in regard to Product Service Systems (PSS) design. In a wide-ranging work, including future innovation, lower-income nations' approaches, and on Chinese perspectives, a chapter addresses teaching sustainability to design students (Marttila & Kohtala, 2014). It argues for moves from ideologised views to transdisciplinary views on sustainability and constructivist and collaborative pedagogies. These range from individual reflections to distributed knowledge sharing on digital platforms that as a hybridised whole form dynamic of design knowledge and know-how.

More recently, as part of the international LENSin network, Garcia Parra et al. (2021) discuss the frames and use of extending PSS and design education to Sustainable Product-Service Systems (S.PSS) and Distributed Economies (DE). With attention to an approach of sustainability for all, extending to a diversity of stakeholders in participative configurative processes refers to a key conceptual and operational shift from

Figure 3 ▶
Collaborative
Silicon model
of the 'Grown
Perfumer'
(XIANGVEI) glued
to the body (Zou,
2019). See Zou
(2023).

centralised and decentralised to distributed economies at local scale and engagement. Educationally, diverse country reflections are drawn on to argue that design works as a translator in making new concepts actual and in context though their local definitions and characterisation differ culturally and situationally.

As mentioned in Essay 2: Altering Prospective Design Pedagogies, network knowledge brokering, facilitating and garnering activities, together with future designers as change agents, are seen as central to supporting new perspectives on social sustainability and 21st century challenges (Garcia Parra et al., 2021: 141). Further, aspects of critical and hybrid ecologies (Witzgall et al., 2021) include human-non-human relations and ones oriented to nature and the Anthropocene (e.g. Maldonado, 2019; Boehnert, 2021). In such an 'ecologising design' (Avilá, 2021), what is central is to hold onto relational making and poetics [Figure 3] so as to make material for and materialise 'designing for interdependence' (Avilá, 2022).

This concerns elaborating what he labels a political ecology of the artificial where focus is also on the biological as a mode of resistance to what he calls 'industrial inertia'. Design educators often do work in similar ways to engage students to learn in place with non-human actors. What is significant for enriching this learning is to focus on what Avilá presents as emergent relations and affective processes. These contribute to finding alternate life attracting and affirming futures. Avilá's concludes:

> *Aiming at cooperation rather than competition could become the drive of co-adaptation yet we devise inclusions and exclusions, and intuitively choose the fish over the fungi, and lovingly the human child over the scorpion. Life is at stake. Naming something alter-native supports framing a poetics of relating, a designing for interdependence which engages with worlds that diverge, to fabricate a gentleness that can relate to vulnerable beings and might help us sense and care for whom and how our worldings matter. (Ávila, 2022: 151).*

Amplifying relations: culture, sustainability and design

In reflecting on their model for DfS, Ceschin and Gaiulusoy (2020: 164) refer to its evolutionary genesis along with key developments in perspective on making in design and suggest an additional innovation direction:

> *This innovation level focuses on socio-technical-ecological systems in their entirety, with a focus on ongoing transitions as well as on post-transition contexts. With the addition of this level, we envision the DfS field to become Earth-centric and to operate with consideration of the future of not only existing humans but also of non-humans and future generations.*

Such a view, a shift 'from eco-design to design for cultural sustainability' (Skjevern, 2017: 22) is taken up by one of the active PhD students in FUEL4DESIGN's events, and related research (Figure 3). In his thesis work at AHO in Norway, Yue Zou from China has developed what he articulates as an 'Eco-Cultural-Techno Design Speculative Approach' that explore post-humanist perspectives, ecological and DFs views, cultures of consumption and design imaginaries through speculative design (SEE Essay 1: Anticipatory Design Literacies for a diagrammatic schematic of this approach; [→ SEE FEATURE 1].

A relational perspective is central to this work; it has needed to disentangle layers of complexity and systemic matters of altering perceptions through design fictioning that concern consumerism and changing matters of consumption and social cultural imaginaries located in popular culture. Zou's work points to the growth of new materialism and posthuman design that has potential to be linked further with anticipatory takes on sustainability. As Snaza et al. (2016) assert, this is a matter of re-attuning to the materiality of education, and in our case doing so concerning design futures ones - in and across the diversity of design in design disciplines and pedagogies, research approaches and methods..

Though Zou's design doctoral work in the form of a thesis by compilation/publication (Zou, 2023) has its specific transdisciplinary focus (see Figure 3), it aligns with the argument advanced by Skjevern and Reitan (2017a) in *Design for a Sustainable Culture*. For these colleagues - at our peer institution OsloMet University – 'design toward well-being' is central in the recent emergence of a focus on cultures of sustainability and culture, in realising sustainability through designing, and design as a cultural frame for sustainability (see also Meireis & Rippl, 2019). Skjevern and Reitan (2017b: 2) observe that:

> *Until recently, design's significance as a tool to transform the environment and affect people's lives has been relatively unknown outside the design community. The discipline's cultural platform, humanistic intentions, multidisciplinary approach and practical goals constitute values that need to be communicated and further discussed and developed. The discourse on sustainability has hitherto been dominated by the social and environmental sciences, and design research is a fruitful complement to these disciplines.*

Concerning the theme of design, sustainability and education for developing wider literacies of citizen awareness, and at secondary level, Lutnæs (2017: 182) makes connections to systems-oriented design and references its related device of giga-mapping (massive mapping of complexity, see below) that aims to spatially and informational pattern complex systemic relations and significant dimensions. Lutnæs charts a four phase reflective model:

> … that fosters both knowledge of social inequity and exploitation of nature and skills to rethink and transform unsustainable patterns of consumption. Visualising the complexity in consumer culture through a GIGA-map makes connectedness and ethical dilemmas tangible as a shared platform to conduct reflective inquiry. GIGA-maps make the consequences of over-consumption more perceptible and thus less easy to ignore. Confrontation is the first phase of reflective inquiry as well as the process of rethinking consumption culture. Consequences of climate change need to concern people at a personal level if they are to question and transform deep-rooted structures of society towards ways of living within the capacity of our supporting ecosystems.

Such attention to a systems-oriented design device for mapping complex relations in regard to sustainability design education is also taken up by McMahon and Bhamra (2017). They visualise students' collaborative experiences in holistic learning on sustainability, with focus on three paths: communication, interaction critical and thinking. Critical junctions between these were visualised and were part of surfacing the interconnectedness of students' competencies, their differentiation over time and according to need as part of supporting learning that tackles the complexity and transformation for participants and facilitators reaching toward more sustainable futures.

In supporting and infusing these conversations and change processes with facts and with hope, as design educators and students we need to shift our critical thinking and our concerted actions into energised activities that centre on the persuasive and the communicative. We already see how these are adopted and adapted in strategies and programmes of greenwashing around the UN's Sustainable Development Goals (SDGs), such as argued by Munro (2021) and how they are deployed in lobbying and mediating the perpetuation of fossil fuel use bent on profit.

Design professions, design educational institutions and design research organisations and alliances and their funders are indeed engaged in many levels of addressing these needed changes. However, if the underlying political economic models and their embedded practices that have led us into this collective zone that requires urgent acts of averting disaster are not altered, and deeply so, we will remain encircled by our own systemic limitations.

These select mentions of work in sustainability, design, culture and learning indicate the importance of analyses and pedagogies that address wicked problems, complex systems and collaborative design pedagogies and processes.

Changes in Design for Sustainability

BY Yue Zou

PHD THESIS: Zou, Y. (2003). *Speculating on Design, Life Styles and Forms. Studies in the contexts of climate change and sustainability.* Oslo: AHO. pp. 35-44.

SUPERVISORS: Professors Andrew Morrison and Håkan Edeholt (AHO, Norway).

Design for Sustainability (DfS)

The environmental movement and changes in the sustainability concept have long affected design. Here, I introduce the development of sustainable design approaches and the current stage of design towards sustainable transitions that react to the new notion of sustainability.

Victor Papanek (1971) is among the pioneers who called on designers to rethink their profession in light of the environmental movement that emerged in the West in the late 1960s and early 1970s. Design for the Real World is in many ways a design manifesto for sustainability. In brief, Papanek argues that we need to rethink the role of design in our society and address its power to address ecological and social issues.

Tony Fry (2009, 2020) puts forward a view of design's role in improving society and the environment and believes that design can lead to a transformation for sustainable development by changing design itself and considering the notion of futuring. He uses 'defuturing' to address the essential things we need in the future instead of future things that could harm our environment. Further, Fry (2009) asks us to rethink sustainability and use 'sustain-ability' to address necessary abilities to lives and cultures.

Under the notion of defuturing, Fry (2009) describes design as a 'redirective practice', working to stop disastrous unsustainability and let the diversity of humanity be directed towards a more sustainable world with a suturing character. Moving to a sustainable future requires two types of actions for making connections. The first requires all unsustainable practices to change, including those that create unsustainable qualities and trajectories of maintaining the status quo. The second refers to applications, which means using newly redirected practices to change the status quo; this redirected status quo can then create sustainability in the economy, social structure and cultural and political order.

To support these actions, changing platforms and designing in time are two methods Fry (2009) cites as options in design-based action for sustainable change. Designing in time means that designers need to think of time and especially futures that can inform and redirect practices that are happening now. Changing the platform means that designers need to alter their approaches and practices concerning the social-technical system through which design may be able to facilitate more sustainable designs as a learnt act of critical deconstructive reading. Fry's (2020) book is a new edition of his 2009 work, which he rebrands in the title and concept of defuturing to resonate with emerging phenomena like the Covid-19 pandemic. In this latest version Fry (2020) defines defuturing as follows:

as a learnt act of critical deconstructive reading, [defuturing] is able to trigger an unmaking of the ground of thought and 'logic' of fabrication, form, utterance and image, upon which present worlds, and world-mak-ings, stand. Defuturing effectively exposes the negation of world futures for us, and many of our unknowing non-human others. (p. 10)

With such relational thinking, which is 'a way of thought that is not based upon cause-effect relations but on correlative processes and structures, and as such draws on the correlative thinking of the ancient Chinese' (Fry, 2020, p. 11), design becomes a presentation of 'fields of effects' in our world instead of being focused on a singular designed object and consistently engages with humans, nonhumans and the environment. Design is thus both artificial and natural and provides the ability of world-making to build care-centred relationships geared to sustain futuring between actions, ways of living and their effects on environment and non-humans. This view concerning relationships between humans and non-human to facilitate what Fry calls sustainability challenges the notion that design is a tool locked into functionalism, determinism and consumerism.

The history of DfS is complex and challenging to frame holistically because of its broad theoretical and practical scope. Recently, Fabrizio Ceschin and Idil Gaziulusoy (2016) mapped out the different design approaches for sustainability. They divide DfS into four levels over time and along the two axes of insular and systemic and technology and people. This refers to a transversal shift and series of related and in some instances overlapping interactions between the technical-centred and human-centred to the system-centred, which is accompanied by a shift from single products to complex systems. The four levels are the product, product-service system, spatio-social and socio-technical system levels. Their DfS evolutionary model, with its mapping across time, and the emergence and repositioning of the term sustainability also allow us to connect such developments to the changing nature of the contexts of design, environment and ecology and culture and technology.

At the product-service system level, product–service system design as a design approach to sustainability aspires to change production-consumption systems with a socio-ethical component of sustainability through business model innovation (Vezzoli, 2007; Vezzoli and Ceschin, 2011). The spatio-social system level also addresses system innovations with two approaches: design for social innovation and systemic design. The spatio-social level can place heavy emphasis on community but sometimes misses the importance of sociotechnical systems, while systemic design focuses on production systems, sometimes overlooking consumers' social behaviours.

From the perspective of a cooperative or regenerative culture, addressing cooperation between humans and nature, participatory and co-design approaches are suitable for use in an ecological design domain to heighten plural inputs and participation and the roles of stakeholders, including humans, nonhumans and the environment (Lindström and Ståhl, 2015; Rice, 2018; Smitheram and Joseph, 2020). Kristina Lindström and Åsa Ståhl (2015) combine actor-network theory and participatory design to build a participatory design approach embracing imagination, uncertainty and complexity. In this process, participation between humans and non-humans in a co-designing process leads to generative 'figurations' (used to examine materiality and cultural imaginaries in feminist technoscience) to explore the question of 'what if?' and the emerging relationships entailed by that question.

From a posthumanist viewpoint, participatory design can also become a place-practice-based process of making with the environment and engaging with non-humans collaboratively through relational and non-anthropocentric thinking (Smitheram and Joseph, 2020). The notion of collaboration between humans and non-humans from generative culture calls for a non-anthropocentric view of the ecological design approach for sustainability.

Ecological design and sustainability

For environmentalists like David Orr (2004), ecological design is more than producing ecological products that preserve nature and the consumer economy; it is instead a matter of connect-ing science and culture to remake human presence in responsible communities.

More recently, ecological design has been viewed as involving 'hyperobjects', to use Timothy Morton's term (2013). These hyperobjects are themselves materialised networks of new artificial creations and operate as an ecology of their own. This is an imaginative endeavour to address very real issues and creatively alters instrumentalised discoveries through the realisation of the awareness of uncertainty and complexity rather than projecting an idealised healthy ecosystem (Haraway, 2016). Ecological design, therefore, considers a new ecological culture that does not separate humans from nonhumans and views life as present in all material formations (Bennett, 2010). Kallipoliti (2018) defines ecological design as working to address material, cultural and aesthetic issues from the Anthropocene and posthumanism.

These various design approaches indicate that sustainable design and design practice for sustainability may involve – and may need to include – diverse perspectives from the ecological system level to the individual level and from the global scale to daily life. These views all show the complexity of relations between the ecological, cultural and technical in sustainable futures to which we need to commit and secure and will need to continue to encounter in future design inquiry and making.

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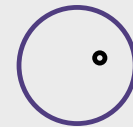
Unpacking sustainability and social innovation

We have seen shifts and turns in Product Service Systems to include Social Ecological Systems (SES) and to sustainability and systems being far more entwined in relation to local communities, corporate responsibility and approaches to social innovation. The latter has been manifested in designerly work in developing global networks on social innovation and transformation, such as around the work of Manzini (e.g. 2015) and the DESIS Network for Design Social Innovation and Sustainability and its globally distributed labs (Link). The aim of DESIS has been to 'use design thinking and design knowledge to trigger, enable and scale-up social innovation'.

LeNS, The Learning Network on Sustainability, funded by the ERASMUS+ programme, has an international scope (Link) in its enstructuring of a network of networks:

> *LeNSin ambitions to improve the internationalisation, intercultural cross-fertilisation and accessibility of higher education on Design for Sustainability (DfS). The project focuses on Sustainable Product-Service Systems (S.PSS) and Distributed Economies (DE) – considering both as promising models to couple environmental protection with social equity, cohesion and economic prosperity – applied in different contexts around the world. LeNSin connects a multi-polar network of Higher Education Institutions adopting and promoting a learning-by-sharing knowledge generation and dissemination, with an open and copyleft ethos.*

The LeNS network generated exchanges between design schools and organisation via ten local labs and open access platforms and practices, with downloadable tools and resources, supported by courses, lectures, cases and projects. Such networks of networks thinking, resource generation and exchange offer platforms and examples for further consideration design futures education. In addition, they would do well to be provided technical and communicative platform level support as a tangible part of design education institutions' own professional communicative public literacies that would further position them in anticipatory change arenas.

Two related publications provide thematic bookends for ways sustainability and social innovation have been presented and positioned.

In *Design for Environmental Sustainability*. Vezzoli and Manzini (2008) address product development processes and ways life cycle design and assessment of products may be better understood and supported in the context of the U.N decade on Education for Sustainable Development (2005-2014). In the more recent *Politics of the Everyday* (Manzini, 2019) stretches such focus into strategies and practices of social innovation in which forms of design intelligence may be understood through connecting autonomy and collaboration via communities and partnerships. In his 'Foreword', Dilnot (2019: Kindle) explains the motivation for this first book in the 'Designing in Dark Times' series that 'is conceived as a contribution to the wider necessities of dealing with a vulnerable precarious world, of establishing project not profit as the basis of action, and of building the bases for wide-ranging emancipatory politics'.

Manzini also moves his focus from product sustainability and environmental scoping to social innovation. He argues that while our lives are increasingly technologically mediated it is our everyday hyperlocal practices of social innovation that offer hope and promise in 'humbly recognising that whatever we think and do, we cannot but think it and do it from the point where we find ourselves'. (Manzini, 2019: Kindle).

Interested in diffusion of social, local innovation, Manzini writes for everyone involved in design activities. His views cover: lightness and openness in social formations in a world that is fluid; ways autonomy and collaboration may be expressed in projects and given means to realising them but also in shaping new conventions and the use of what, by extension, he calls pseudo-traditions; relations of everyday politics in the shape of design activism and 'transformative normality' around the very local that includes histories of social and cultural activism together in places and environments that influence them, and form where they may be changed, transgressively and via sharing and platform economies; ecosystems of ideas and projects in making democratic participatory design project work (commoning, experimenting, participating, and making things happen).

These select orientations to sustainability and anticipatory design and literacies raises many issues. They point to a number of matters for continued dialogue. This dialogue may be centred around making connections, respecting environments, activating local participation, and knowing and consumption practices. It may extend to looking with curiosity into how we learn together about what 'post-industrial' sustainable futures might become or might morph into unless we tackle testy problems and questions possible and probable but also emerging and unseen directions, options and pathways.

We may need to learn more about histories and practices of sustainability, from re-use to situationally specific and different experiences and knowledge. However, we will also need to look also to underlying systems and political economies, to cultural-technical innovation and to ways businesses adapt and alter models and offerings and services alongside drives for more local engagement and informed by them. Our discussion raises two key questions:

> *What issues, possibilities and pathways might we take up further in our pursuit and support of fomenting and fermenting design futures literacies, sustainably, through sustainable inputs to a futures view and futures views into design sustainable literacies making?*
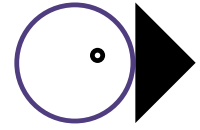
> *How are such participative and ecologically framed and less anthropocentric approaches and practices of sustainable design to be understood without addressing their underlying, complex, confusing, entangled and obscured systemic design relations?*
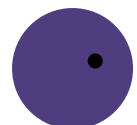
5.
SYSTEMS, FUTURES, DESIGN, LEARNING

BY Andrew Morrison

Situating systems views

Beyond systems determinism

Systems views have profound reach yet are difficult to change. This is apparent in the rise of imperialism since the 1500s and the role relations between goods, products, services and marketing have played in layering globally entwined economies within which design is implicated and as argued in this book need to be considered in redesigning futures designing. Systems approaches are widely used in Futures Studies and the more recent Anticipation Studies. Attention to social and cultural innovation and the role of design in shaping systemic change for sustainable futures works with dynamic soft systems approaches and extended notions of foresight. However, the situated making-knowing relations of recent design inquiry and learning is often bypassed in what might be called systems determinism, where in terms of design futures literacies, agency and critical creative production and multistakeholder participatory design are key concerns.

These distinctions also arise in the context of the 'rise of service economy' in the early 21st century. Since the launch of imperial economies in the 1500s, through the industrial manufacturing age and into the post-cold war, what can be commodified has moved beyond just material resources. 'Servitisation' in neoliberal economies made it possible to turn intangible relational aspects into commodifiable transactional elements. It makes sense then that design has evolved to see systemic relations through a PSS lens as that view yields bits that are commodifiable.

Systems, flourishing and learning futures

In late 2022, one of our colleagues at AHO, Birger Sevaldson, published a comprehensive synthesis of his ideas, designing, teaching, research and network building centred on what he has named Systems Oriented Design (S.O.D). In Designing Complexity. The methodology and practice of system-oriented design, Sevaldson (2022) draws on developments in systems theory, making and thinking (e.g. Bánáthy, 1996) to arrive at this specific design view (sese also Nelson & Stolterman, 2012). For Sevaldson (2022. 6):

> *… design has the prospect of being much more useful amidst the growing complexity of our world; in fact, there is a need for it to manage even higher levels of complexity. This challenge is realised and taken on in several fields like service design and social design. To a large degree, these new design fields deal with systemic issues, and are involved in*

the design of systems. However, these efforts are limited to their fields and framed by their perspectives. What is needed instead is a general overarching approach to deal with complexity in design. This approach needs to be both powerful and flexible. It needs to fit the 'designerly way' of knowing and working, which implies that designing is an activity for the production of knowledge. Furthermore, it needs a theoretical root-perspective, one that is not obstructive to the design process. Lastly, this approach needs to be able to flourish and grow instead of being defined and frozen, so that it can be a living process that continues to develop as rapid changes pile up.

Sevaldson traces the development of systems thinking via what Midgley (2000) demarcates as three waves. The first wave, commencing in the 1950s, was causally driven, predictively oriented and quantifiable and labelled a 'hard system's view. The second wave, active from the late 1970s, took a more 'soft systems' view centred on human and non-technical factors, and advocated multiple views, intersubjective meaning and action and pragmatic construction. In the late 1980s, a third wave began that emphasised power, methodological pluralism and critical systems thinking. Cabrera et al. (2021) add a fourth wave to account for developments since the early 2000s, with attention to universality in relations between mind and nature, bridging physical and cognitive complexity.

Sevaldson mentions that where systems theory and thinking developed means to address complexity, holistic understanding and work towards change - including organisations, negotiation and innovation strategies and activities - it did not always address design and its many seemingly divergent, non-linear and exploratory, and less systemically linear, processes. These are ones he elaborates in his design approach to systems thinking. For Sevaldson (2022. 22):

The emergence of systemic design is not so much about integrating external systems theories into design, as has been tried before. It is more about nurturing the inherently systemic practices of design and to integrating existing theories into design by re-interpreting them and modifying them so that they become useful without interrupting the design process. Instead of submitting to one or the other orthodoxy of systems theories, this results in a pluralism of theories and methods in design, and a flourishing field of real world practices.

Sevaldson assembles a large body of systems theory, practical Systems Oriented Design projects and discusses their design specific purpose, characteristics, processes and dialogical mode of knowledge building qualities and practices. This he presents in the form of an open access book, supported by online resources (see below). He summarises the work of Meadows (2008) focused on system dynamics, borders, boundaries, feedback loops and softer notions of hierarchy (Sevaldson, 2022: 127).

The emergence of Soft Systems Methodologies highlighted this further with reference to the work of Checkland and his view of creating purposeful learning activities. 'Checkland is clearly aware of SSM's limitations, stating that it is basically a learning system for human activity systems a tool to create purposeful activities rather than

creating models of the real world (Checkland, 2000),' writes Sevaldson, 2022: 128-129). This concern points to Checkland's interest in problem situations and making 'rich pictures', concepts Sevaldson himself elaborates on in his own focus on design problematiques, rich design spaces and giga-mapping methods.

These concerns were also apparent in the demarcation of two main aspects of Critical Systems Thinking (Midgeley, 2000): power relations and multi-methodologies. Readers will see that these are also key concerns in our own work into design futures literacies and pedagogies in FUEL4DESIGN and in terms of design futures literacies and pedagogies more widely. Sevaldson (2022: 144) argues that Critical Systems Thinking is valuable for design '… because of its width and depth spanning from the crafting of objects to industrial production, services, interaction, social design, bridging culture, economy, technology, sustainability, politics, and much more. It is clear that no one single systems approach, method, or practice is sufficient for design.' He argues further (ibid.) that 'The criticality introduced by Critical Systems Thinking helps to judge different approaches, and to apply them where they are most suitable, as well as to critique and triangulate their output.'

On Systems Oriented Design (S.O.D.)

Integrating design with systems thinking is central to the positioning and articulation of S.O.D. As a form of meta-design-process, Sevaldson (2022: 30) characterises four poles that constitute a field of possibilities: Design practice; Design thinking; Systems thinking; and, Systems practise. S.O.D. is seen as s a living and dynamic design practice and methodology without fixed methods, for Sevaldson (2022: 2, 7), and may be understood in terms of praxeology or the framing, analysis and practice of practice.

In short, for Sevaldson, key recommendations for design practice (and learning) are: Cope with more: Visualise! Design relations. Look ahead. Design synergies. Design for unfinishedness. Less models, more fields. Learn very fast. Use your power. The following tools and devices for achieving these may be mapped, one might argue, to what he terms The Library of Systemic Relations (relational, structural, semantic, social and causal; Sevaldson, 2022: 259). The tools and devices have considerable applicability for design futures learning and teaching. They are:

1. Giga-mapping (massive visual-spatial charting of complex relations and processes)

2. ZIP analysis (Zoom, Innovation, Problem or Potential)

3. Impact and threshold analyses (Impacts, Synergies, Counter-effects, Resilience)

4. Other analyses and evaluation tools (leverage points, intersection points, pro-et-contra analysis, worst case scenarios, back-checking, counter-intuitive analysis, risk analysis, pace analysis)

5. Layered and nested design processes (designing and redesigning)

6. Media-rich design processes (media-based and influencing, multiple, diverse and deep)

7. Switching effect in hybrid design processes (and media, and modes when stuck)

8. Very rapid learning processes (quick information advantage, knowing unknowns)

9. The rich design space (physical, spatial, embodies, present).

A not unrelated list is given by Dominici (2017: S1455). With regard to the last of these listed above, Sevaldson (2022: 306) refers to the recent 'pandemic pedagogies' of design, writing that:

> *The very purpose of a Rich Design Space is to have the flexibility to integrate new information whenever needed. This flexibility is so far not easily achieved with digital spaces, and the operation of the spaces tends to be monopolised by a few operators. The use of shared digital co-mapping tools like Miro and Figma increased dramatically during Covid and they have shown to be useful and partly filling some of the features of the Rich Design Space.*
>
> *The Rich Design Space brings together two ideas. The first one is the idea of the design space. The second is the idea of the richness imperative.*

Such attention to richness and imperative are in several respects core items in the development of S.O.D. Sevaldson (2022. 193-194, original italics) presents two main principles on which S.O.D. is built and positioned. The first is that 'Design thinking is inseparable from designing'. Here the practice in focus is designing. The second is that 'We need to merge Systems Thinking and systems practise with design thinking and design practice to fully benefit from relating the two fields.' Here his argument is that we cannot just import systems approaches into design. What this comprehensive 'amalgam' of works and views that Sevaldson offers is well expressed in his own words:

> *Designing complex systems means designing in a new way, partly giving up control, partly leaving the planning/executing mode and work over time with systems as they change. It also means designing on multiple levels and catering for secondary effects, nudging and triggering more than imposing, and to let things grow and flourish rather than construct and harness. (Sevaldson 2022: 14).*

Systems, resources, futures and design learning

Perhaps less well known than the more pervasive spread of digital services and the growth of Service Design, interest in systems and design and design views on systems has grown considerably this century. This has been achieved through the establishment of networks of interest, participation and sharing centred around the *Systemic Design Association* (**Link** ↗) and the *Systems-Oriented Design Network* (**Link** ↗). Connected to these is over a decade of proceedings of the *RSD Symposia* (**Link** ↗).

Next, we refer to a few recent activities and publications from the *RSD11 Symposia* relating to design education. This citation is in addition to earlier papers and presentations at RSD Symposia and to the many student projects presented in the Systems Oriented Design site.

In addressing the *RSD10* theme of 'Playing with Tensions', Gulden et al. (2021) held what they called a 'playshop' that drew together ludic probes, framing devices and the design of learning spaces, to reflexively - and in a mode of cross-pollination - surface tensions around assumed and tacit assumptions about design, systems and knowing.

A second workshop, 'Reimagining the Futures Cone: Past, plurality, and perspective', by Carey et al. (2021), sought to use visualisation 'to challenge design tools that erase the past and assume a universal perspective by imagining new futures models' so as to 'create a space for designers to discuss and create models that take a broader perspective on how we intend to future'. In the format of a dialogue session, Kahn and Ing (2021) opened out discussion around appreciation on ways wicked problems in the present may be altered through recognising non-human natures beyond anthropocentric presuppositions so as to learn how to develop different futures influencing outcomes.

Following a retrospective approach on two decades of work, in a paper entitled 'Education as a transforming practice: Preparing together for complex, sustainable futures', Hummels and Lévy (2021) focused on the application of five core principles of the approach (complexity, situatedness, aesthetics, co-response-ability and co-development) 'to help transform current education systems into corresponding lifelong learning practices that support designers and participants in designing alternative complex, sustainable futures.'

This selection of systems, education and design papers indicates that design education and futures approaches are also nested within a domain-specific sector of designing and its research. They suggest that there is considerable room for the further cross-pollination of experience and knowledge, as well as looking to the wider and longer term design futures-oriented curriculum beyond the master's and doctoral studios, labs, field work, projects, exhibitions and theses [→ SEE **FEATURE 2**].

That the well-established and successful network around systems and design has also become more international is also apparent in the recent establishment of the related journal *Contexts: The Systemic Design Journal* (**Link** ↗). The article 'Contra-Innovation: Expanding the innovation imperative in the context of futuring, defuturing and fictioning' (Perera & Fry, 2022) suggests that further debate is needed on what is meant by innovation and the roles of models of defuturing and speculative designing (**SEE Essay 1: Anticipatory Design Literacies**).

PoliMi PhD project

GROUP: 9

YEAR: 2022

TEACHER: Manuela Celi

STUDENTS: Zachary Edwards, Jisoo Kim, Lars Lampani, Alberto Milano, Alexandra Spassov, Davide Stefani & Chaoyi Zhang

TAGS: Power. Survival. Nourishment.

Pissing Pants

Long droughts have caused water to become the new currency, people are collecting every liquid that is produced by their bodies. This has influenced the natural food production, instead people nourish themselves with tasteless synthetic food. Lower social classes are forced into collecting their now precious tears with a facial device that is connected to a portable bottle, in exchange of food. FoodPorn Mag launches an annual edition with different features showing the new flavours, presentation and shapes of synthetic food, the fabrication of food is made mixing specific powders and tear-water. Another product for liquid collection is Pissing Pants, a garment that collects the user's urine while being worn. A collector is connected to a network of tubes that carry the urine to soil filled pockets, allowing the user to grow their own vegetables and fruits.

Futures Design, Language and Systems – A Workshop at RSD9

BY Palak Dudani

BLOGPOST: 18.11.2020 / DESIGN FUTURES LEXICON

AVAILABLE: Link ↗

▲ A screenshot of the workshop outline and mode of online participation at 9th Relating Systems Thinking and Design (RSD) Symposium at NID Ahmedabad, India, 9-17 October 2020

As FUEL4DESIGN project members from AHO, we held a successful workshop on the Design Futures Lexicon at the 9th Relating Systems Thinking and Design Symposium at NID Ahmedabad, India, 9-17 October 2020.

With the title 'Futures Design, Language and Systems – Towards languaging pluriversal futures', the workshop aimed at building an understanding towards 'languaging' of futures and open a systems-level enquiry into challenges of imagining alternative and pluriversal futures within design.
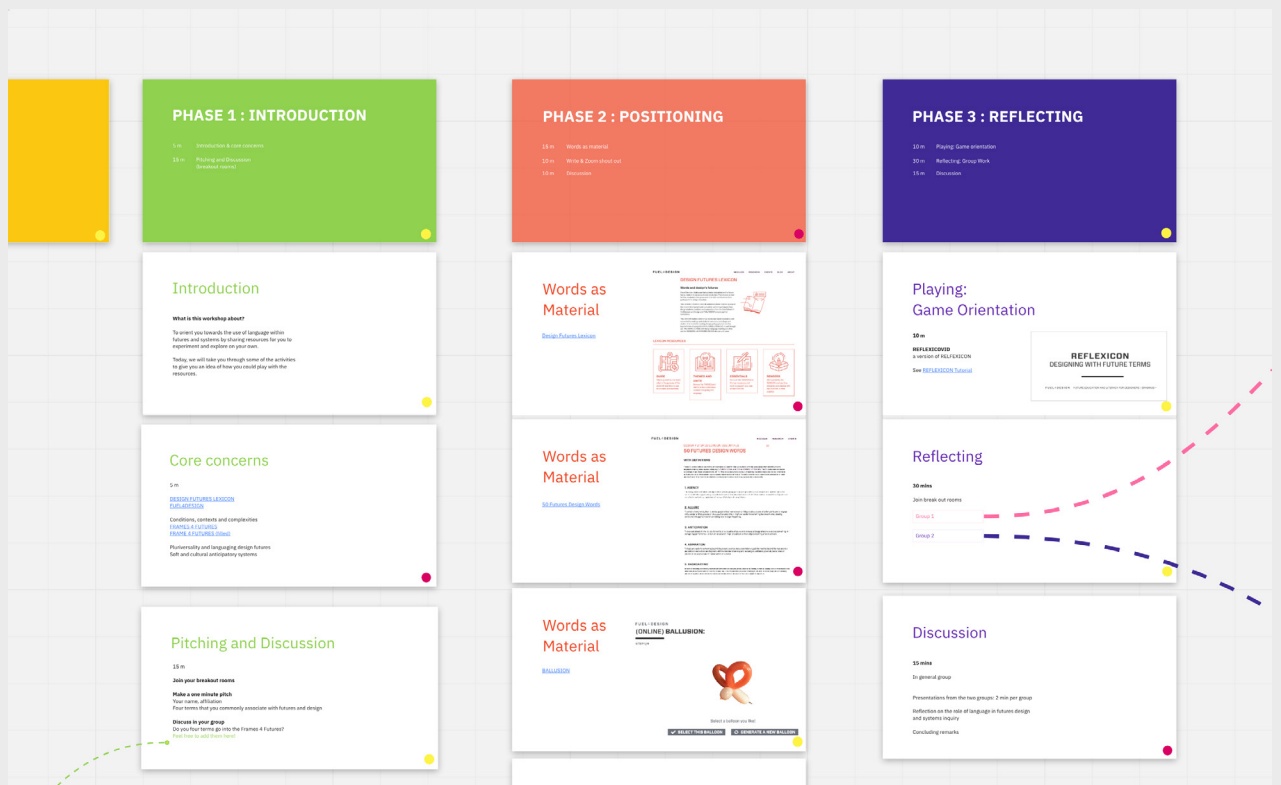
Words and language are inextricably linked with a designer's ability to shape futures, both productively and analytically. This workshop built on the work done within the first work package 'A Lexicon of Design Futures Literacies'. The workshop focused on introducing a suite of tools curated for an exploration into the role of language within futures design projects.

With the long-standing experience of Systems Oriented Design at the Institute of Design at AHO, the workshop raised questions of language discourses, issues of mediations and representations, especially when working on futures with systemic implications.

Participants included a mixed group of master's students, educators and researchers. They were introduced to an archive of resources and taken through some activities to build curiosity and familiarise for self-exploration. Miro was used to facilitate the workshop via Zoom in

an exclusively online format. It acted as a holistic interface for presentations and a workspace for group work and overall facilitation. This doubled up as a resource and archive for participants to access after the event as well.

The Relating Systems Thinking and Design (RSD) Symposium is an international conference series started at Oslo 2012. The series has the intention to promote and foster the emerging practices and theory development for systemic design for service systems, social systems, policy development and complex contexts. RSD has been held in Europe and North America and most recently India (online).

The workshop began with sharing the resources from the first two themes within the Lexicon. The participants began with

discussing their existing vocabulary when talking about futures. Using a device called FRAMES4FUTURES, participants mapped their words and discussed how those words related to systems design and concepts of complexity, cultures, conditions and communications.

Words contain within them encoded positions and world views which help us connect and articulate concepts. Words with futures orientation contain potentiality, an open-endedness which affords finding new connections as opposed to simply
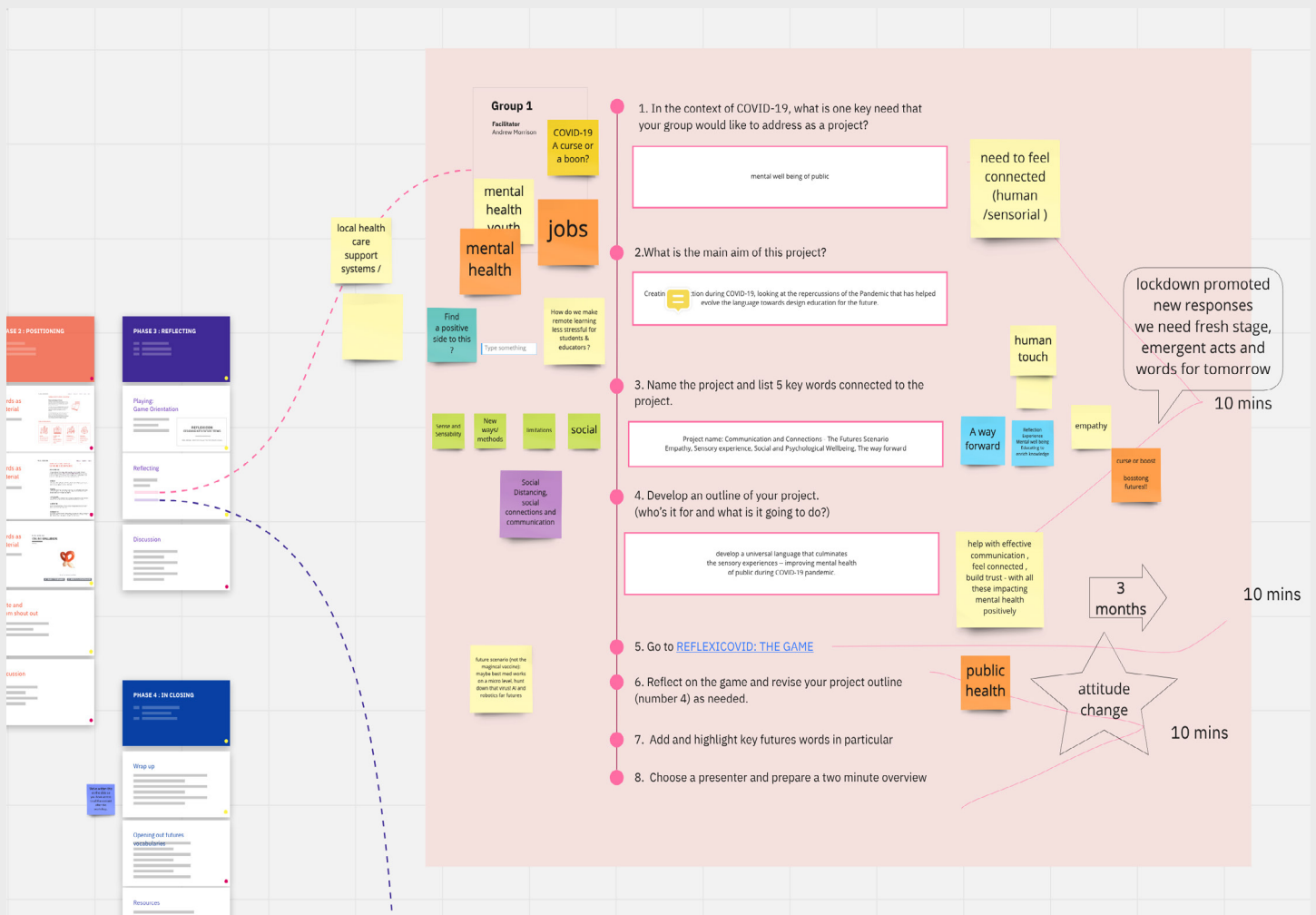
provokes critical reflexiveness when attempting complex problems in relation with language, futures and systems design. The aim was to give participants an opportunity to create a project brief based on the ongoing complex challenges in the context of COVID-19. This exercise allowed them to apply what they had learned in a practical project setting. We thank the participants for joining us for the event and we welcome their inputs and suggestions.

▲ A screenshot of the Miro board with participants responding to prompts from the first set of activities when using the FRAMES4FUTURES tool (above).
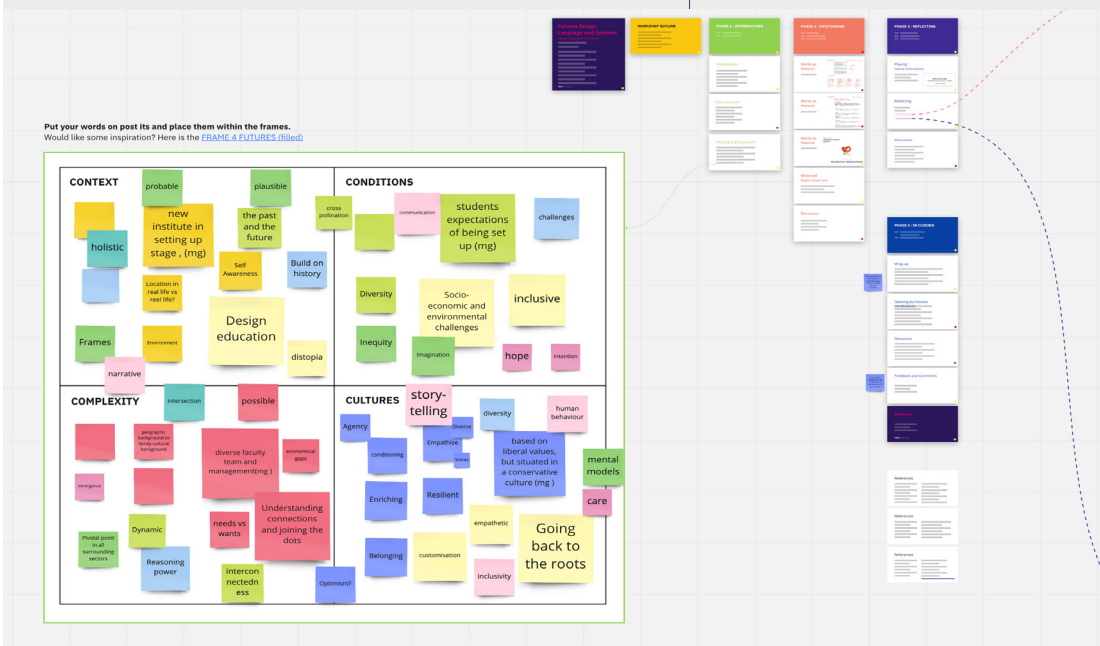
following them. The next phase of the workshop focused on looking at 'words as materials', where the participants were introduced to Lexicon tools such as BALLUSION and REFLEXICON. Using the 50 FUTURES DESIGN WORDS, participants explored new words and definitions and learnt how an explicit futures orientation can influence conceptual affordances implied within words.

In the final phase of the workshop, participants were invited to try out REFLEXICOVID - an interactive game that

▲ A screenshot of the Miro board showing a group workspace (above) and the FUEL4DESIGN Twitter feed (right).

6.
CULTURES, SYSTEMS AND POLITICAL ECONOMICS IN DESIGN

BY Andrew Morrison
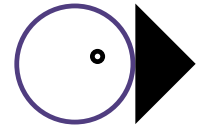
Illustrations of relating systems, future and cultures

Three different examples

This essay also includes three different relational illustrations of linkages between systems, futures and cultures that we have worked with and alongside in FUEL4DESIGN. They are part of a wider educational master's programme in Systems Oriented Design at AHO. This has now been extended to a workplace/executive master's.

The first example refers to an online conference workshop session at the RSD10 Symposia, hosted in India [→ SEE **FEATURE 3**] Entitled 'Futures Design, Language and Systems – Towards languaging pluriversal futures', in this session we included participants in an online session centred on connecting 'languaging' futures and design with DESIGN FUTURES LEXICON. This was connected to an open systems view on imagining alternative, plural futures in and through design. Two tools developed in the LEXICON were taken up (FRAMES FOR FUTURES and REFLEXICON) and used to actively reframe and discuss matters of design futures vocabularies in the LEXICON. This was linked with participants' own professional and educational terms, discourses and practices in the context of global English, and their roles in unpacking complex systems and the motivation of culturally located plural views on shaping futures by design. For a related recent collection on systems design tools, see Jones and Van Ael (2022).

The second illustration [→ SEE **FEATURE 4**] is drawn from a doctoral project in Systems Oriented design at AHO. Taking a large-scale poster format, Hayley Fitzparick spatialises and charts relations between climate, context, community and complexity. Her elaborate visualisations indicate the role of visual and spatial literacies in patterning and revealing relations that can be appreciated not only spatially but also comparatively. Her expertise as a professional architect making material her prowess in surfacing complex matters and how they might further matter for participants learning to engage in their own systemic hyperlocal presence and activities suggests ways in which S.O.S and anticipatory design literacies might be illustrated and annotated. Here a poster format is indicative of how design futures students can synthesise and layer systemic structures and also suggest ones that are as a consequence less visible.

In the third item [→ SEE **FEATURE 5**] two members of the FUEL4DESIGN at AHO discuss their own work, roles, experience and meaning making in working with S.O.D., futures, cultures

of anticipatory design and learning. In doing so, they draw on their own master's and doctoral studies, take up content thematics and difficulties in holding relations pliable, powerful and open while reaching to engage productively with futures-in-the-making through systems designing as dialogue.

Anticipatory design cultures and sustainability-systems dynamics

We propose that there is much to be gained from more systems dynamic views, following a soft systems approach, to design in which the energies and motions of cultural participative and social psychological perspectives may be activated. Here, the furthering of sustainable systems relations should continue to include attention to systems, tools and technologies, to situations and contexts of use. Tromp and Hekkert (2018) argue for the importance of social design, that is designing for social sites and modes of sociality, to modestly but potentially scale up ways to tackle what are societal and political challenges in striving to shape and secure survivable futures (see also López Galviz & Spiers, 2021). Design citizenship education is also framed as supporting awareness and application of socially responsible design. Gray (2018) critiques the uses of social responsibility in 'entrepreneurship ideology' in shaping citizenship education.

Following such social design premises, we see a need to include greater attention to the cultures and practices of knowing and making in connecting and integrating, reweaving and working them through the social materialities of sustainability and systems perspectives and methods. We see these as including participation and engagement, and to embodied and experiential learning. This points to a situated socio-cultural approach to reading, making and critiquing sustainable systems views and practices through activities and dialogues on making, using, becoming and reflecting.

In essence, we suggest including futures in our design spaces and pedagogies, processes and related research and professional practices and futures. They amount to a mode of anticipatory sustainable systemic thinking through action, yet must include diversity, creative swerves and disruptions and transgressive inquiry into the unknown unknowns if we are to shift beyond given and unquestioned frames and already instigated and intractable practices. This aligns with the core arguments in 'Walk the talk: Toward an ecological futures framework for our designed cultures' (Edeholt, et al., 2021). Toward the end of this chapter, we take up a two-way relation in exploring cultures of anticipatory design systems and studies and cultures of systems oriented futures. These are ways of making and thinking, but also creative criticality, of adaptive learning and of processes of unlearning given frames and constraints of the contemporary and institutionalised.

Concerning sustainability oriented innovations, Buhl et al. (2019: online) outline four key challenges to sustainability oriented innovation (innovation scope, user needs, stakeholder involvement, assurance of positive sustainability effects) may be met with key techniques from design thinking. The latter characterised as being non-linear includes: problem framing, user focus, diversity, visualisation and experimentation and iteration. We suggest that these views echoing those of the other essays here and work packages in FUEL4DESIGN, along with those suggested by Hoolohan and Browne (2020).

PhD, System Oriented Design, AHO

BY Hayley Fitzpatrick (AHO)

Alpine-Urban Resilience
Systemic Design as a Co-Creative Path towards regenerative mountain communities

How can we broaden participation in complex sustainability transformations? This on-going PhD project explores this guiding question through a comparative case study of three international mountain communities (Ostana, IT; Hemsedal, NO and Mammoth Lakes, CA, USA).

A Systemic Design (SD) approach is used to iterate a "portfolio of methods" to engage within and across alpine social-ecological systems. Early findings suggest that by holistically connecting across different worldviews, cultures, places, and disciplines, we can more effectively identify and apply our unique roles and impacts each of us have within sustainability transformation processes.

This SD approach is visualized in the diagram aside (work-in-progress), which tracks different qualitative and qualitative methods to collectively understand, react to, and experience current systems and future scenarios in each of the three communities. For example, Systems-Oriented Design gigamapping workshops, synthesis maps and exploratory events are sequentially prototyped across community (next page). Complex variables like culture, language, season, stakeholder dynamics and more greatly shape how the specifics of each method is performed, which opens up opportunities to reframe how replicability and impact is measured in real-world research. Scientific methods like social network analysis are used to understand the innovation potential of each community, providing a quantitative reference point to the participatory and designerly approaches. Student courses at The Oslo School of Architecture and Design and the MonViso Institute are used as an additional means to build trust, multiply engagement potential and nudge change through fresh curiosity.

Through this interweaving process, we can better design opportunities for mutual learning between researchers, students, practitioners and actors apart of mountain communities, as a precursor to systemic action. Building awareness of our diverse worldviews and ways of being can help activate greater capacity to collectively understand our roles within the complex social-ecological systems we inhabit.
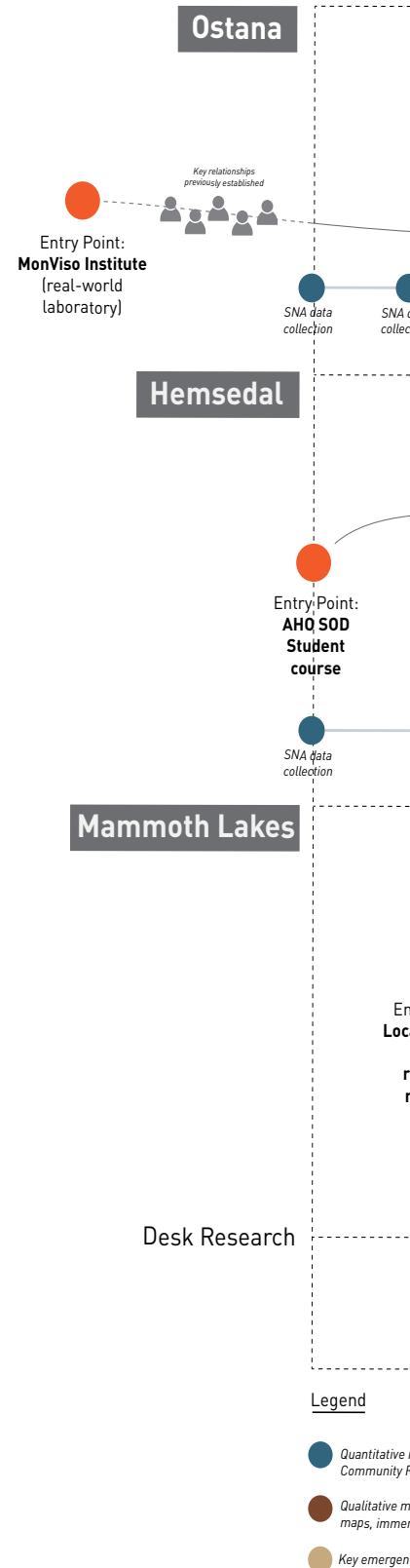
Haley Fitzpatrick
PhD Candidate in Systems-Oriented Design
The Oslo School of Architecture & Design (AHO)
Design Associate, MonViso Institute

Project Start: October 2020
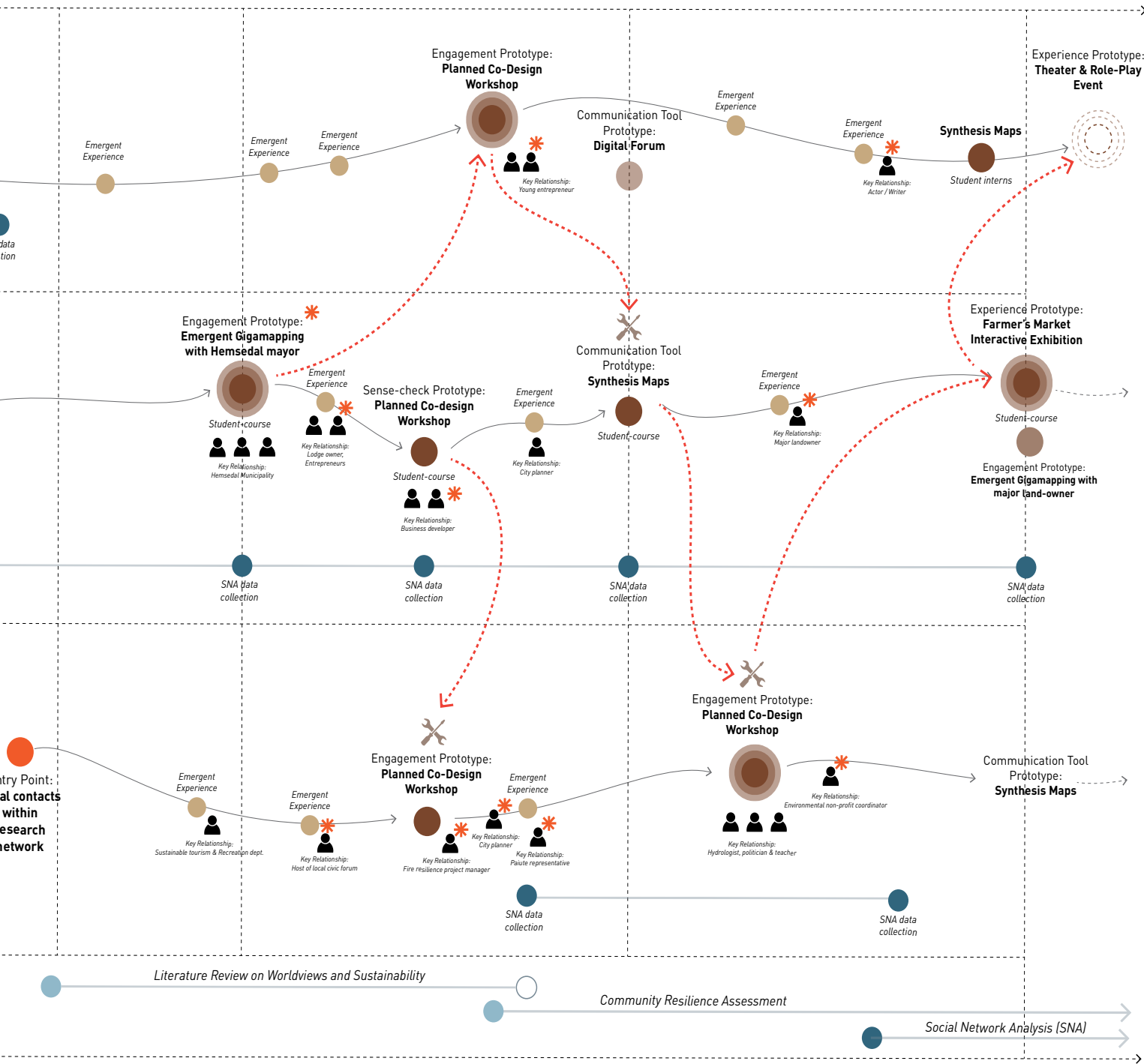Project End: September 2024

Supervisors:
Prof. Dr. Tobias
Professor at AHO and ETH Zurich, Systemic Design Labs Co- founder & Director, MonViso Institute

Prof. Dr. Birger Sevaldson
Professor at AHO
Founder of Systems- Oriented Design (SOD)

Fall 2020

Ostana

Key relationships previously established

Entry Point:
MonViso Institute
(real-world laboratory)

SNA data collection

SNA data collection

Hemsedal

Entry Point:
AHO SOD Student course

SNA data collection

Mammoth Lakes

En
Loc

r
r

Desk Research

Legend

○ *Quantitative Community F*

○ *Qualitative m maps, immers*

○ *Key emergen*

Spring 2021   Fall 2021   Spring 2022   Fall 2022

Emergent
Experience

Emergent   Emergent
Experience   Experience

Engagement Prototype:
**Planned Co-Design
Workshop**

Communication Tool
Prototype:
Digital Forum

Emergent
Experience

Emergent
Experience

Experience Prototype:
**Theater & Role-Play
Event**

Synthesis Maps

Student interns

Key Relationship:
Young entrepreneur

Key Relationship:
Actor / Writer

*data
tion*

Engagement Prototype:
**Emergent Gigamapping
with Hemsedal mayor**

Student course

Emergent
Experience

Sense-check Prototype:
**Planned Co-design
Workshop**

Communication Tool
Prototype:
Synthesis Maps

Student-course

Experience Prototype:
**Farmer's Market
Interactive Exhibition**

Student-course

Key Relationship:
Hemsedal Municipality

Key Relationship:
Lodge owner,
Entrepreneurs

Student-course

Emergent
Experience

Key Relationship:
City planner

Emergent
Experience

Key Relationship:
Major landowner

Engagement Prototype:
**Emergent Gigamapping with
major land-owner**

Key Relationship:
Business developer

SNA data
collection

SNA data
collection

SNA data
collection

SNA data
collection

Emergent
Experience

Emergent
Experience

Engagement Prototype:
**Planned Co-Design
Workshop**

Emergent
Experience

Engagement Prototype:
**Planned Co-Design
Workshop**

Communication Tool
Prototype:
Synthesis Maps

try Point:
l contacts
within
esearch
network

Key Relationship:
Sustainable tourism & Recreation dept.

Key Relationship:
Host of local civic forum

Key Relationship:
City planner

Key Relationship:
Paiute representative

Key Relationship:
Fire resilience project manager

Key Relationship:
Environmental non-profit coordinator

Key Relationship:
Hydrologist, politician & teacher

SNA data
collection

SNA data
collection

Literature Review on Worldviews and Sustainability

Community Resilience Assessment

Social Network Analysis (SNA)

Initial communication with stakeholder

Key relationship established with stakeholder

Key iteration of method

As a core practice of Systems-Oriented Design, several co-creative "gigamapping" workshops were conducted with the Hemsedal community, with stakeholders ranging from local business owners, seasonal workers, young farmers and the mayor himself. Participants were invited to engage in a "visual dialogue" to share their perspectives on the current challenges and desired futures of Hemsedal.

Data from the gigamapping was triangulated and expanded through additional semi-structured interviews, public records, climate data, municipal maps, historical photographs, and observation

Sense-Check & Question
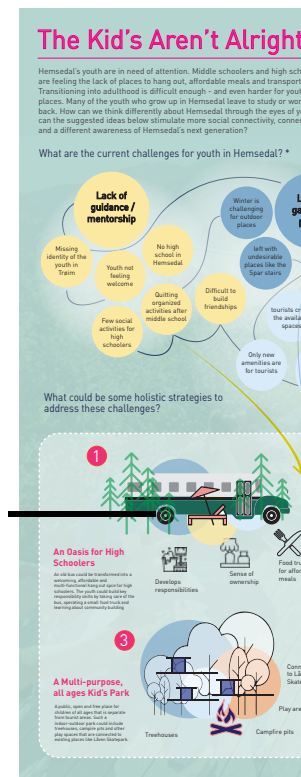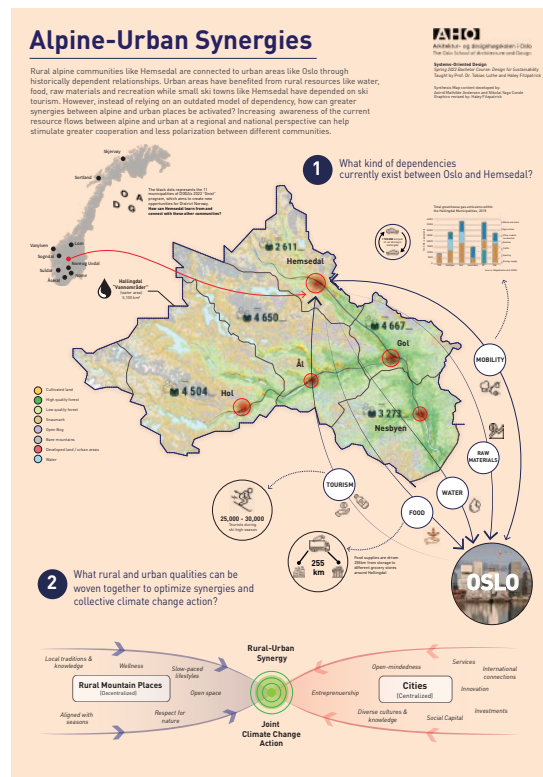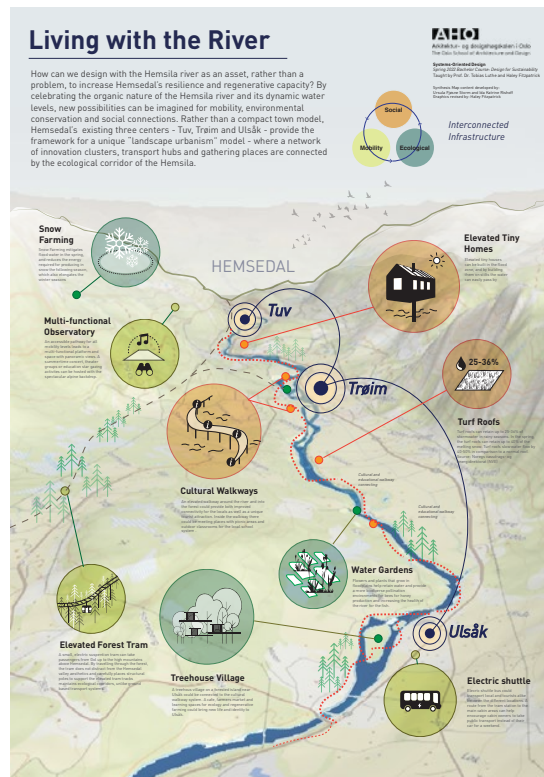
Data collected from the gigamapping workshops and additional quantitative and qualitative methods were translated into five synthesis maps. Synthesis maps visualize relationships across complex systems to engage stakeholders in collaborative decision-making (Jones, 2017). These five interconnected maps work together to describe key challenges facing Hemsedal and offer holistic interventions in how to address them. They are intended as a tool to stimulate new thinking and invite a broader range of community members to "sense-check" the knowledge and ideas represented - do they align with their worldviews of Hemsedal? What would they change or do differently?

These maps were developed through the Systems-Oriented Design Spring 2022 Bachelor Course: Design for Sustainability, instructed by Prof. Dr. Tobias Luthe and Haley Fitzpatrick. The five themes and synthesis process were developed by the instructors, based on previous mountain resilience research in Hemsedal and other alpine communities. Students (Adam Steen Hovden, Andreas Sebastian Øverby, Astrid Mathilde Andersen, Ida Katrine Rishoff, Ingrid Holsten, Karsten Storvik Martinussen, Mons Schau Eriksen, Nikolai Yago, Oda Marie Skuggevik Berg, Ursula Fjøsne Storm) and instructors worked together to co-develop holistic interventions. Graphic design and visualizations by Fitzpatrick.

Population: 2,609
Density: 3 people / km2
Altitude: 600-1450m
Closest city (500,000 ppl +): Oslo, 220 km
Primary economy: Ski tourism

Interconnected Identities

Many people think of Hemsedal as "just" an afterski party destination. Yet there is much more to Hemsedal's identity than this. While the big actors are connected with the tourism industry, there are other diverse subcultures that can be made visible and celebrated to generate a more inclusive, innovative and multifaceted Hemsedal. Improving solidarity and collaboration between these various cultures can be improved through place-based social initiatives like outdoor gear swaps, volunteer coordinator positions and farmers markets.

Students as change-makers

What demographic is currently underrepresented in Hemsedal, yet have high potential for stimulating change? Students! From bachelor to PhD to professional executive master levels, students can operate as regenerative weavers to connect cities and alpine communities. While today tourists make up a large portion of the transient population of Hemsedal, engaging with students could be an alternative path towards more circular economic and social development – through mutual learning opportunities, increased diversity of perspectives and capacity to prototype and experiment interventions with low financial risk.

Did you know?
306,453
students are registered in Norwegian universities.

Embody & Experience

Yet synthesis maps have limitations. 2-D representations of complex social-ecological systems may stimulate new thinking, but experiential learning has the potential to transform worldviews and mobilize action (Bentz, et al., 2022). In the current phase of this PhD project, ways of embodying systemic design are being prototyped through exploratory events and experiences, like volunteer sheep herding and Systemic Cycle tours with AHO students and community members.

They offer a design educational, anticipatory futures elaboration on the mapping of 'design thinking recently outlined by Cross (2023). Or, as Walker (2013) termed this it is a design sustainability and practice inflected mode of seeking to meet 'imagination's promise.

In doing so, we suggest there is room for connections between sustainable and system-oriented design and practices and approaches from discursive psychology (Potter & Wetherell, 1987) and design-as-conversation views where design articulations are felt and voiced, kinetic and verbal, visual and rhetorical. Here there is also room for further analyses using our PHILOSOPHICAL PILLS and DESIGN FUTURES LEXICON for analysing design discourses in making-thinking and thinking-making. This aligns with the writing of Julier and Munch (2019: 3) who see that:

> *Design cultures come into being through the agency of their objects and people. In seeing them as ongoing constitutions and re-constitutions, they are both beings and becomings. And this is where we see the shift from design to design culture. This takes us from the consideration of singularized objects of design to multiple assemblages and also requires a shift of conception. This also takes us from linear flows of meaning to complex, multi-linear ecologies that involve ongoing interactions between design and its human and other participants.*

Sustainability, systems, design learning and political economies

Given the complexity of design to relations of a changing world and between matters of sustainability and related systems and emergent systems-oriented design approaches, it is rather surprising to see how seldom matters of design and economics are addressed. Where this is the case it often does not question underlying political economic logics and practices. In Design Studies, Julier is one of the few scholars and educators who have offered a comprehensive take on fundamental principles and deep implications of design being embedded in neoliberal economic policies and systems. In Economies of Design, Julier (2017: 2) makes an important distinction:

> *Economics and design have never been particularly good bedfellows. One suggests certainties and statistics or, at least, attempts to get a clear understanding of what is going on in the big picture of world events or the smaller one of firms and individuals. The other proposes sensations and aesthetics, opening up myriad ways of doing things, of living, of functioning in the world. One tries to demonstrate the knowable, the other is constantly pushing towards the unknowable. Putting these together creates a seemingly impossible nexus.*

What Julier charts is how neoliberal capitalist production via macro-economic policies and micro-economic practices impact on daily life and how designs we craft, purchase, exchange and consume may be understood in relation to core logics of advanced capitalist market economics. Related models and activities (as neoliberalisation) are driven by values of the privileging of market forces in deregulated markets, they

demand minimal state intervention, they orchestrate privatisation of state-owned enterprises, and secure domination of financial profit over other interests (Julier, 2017: 8). In recent years, the globe over we have experienced the consequences of this systemic financialisation of value and resources in the face of climate change, a global pandemic and geopolitical conflicts. Apparent are the effects of austerity, issues in security and flow of supply chains, growing contest over national protectionism, and increased automation as we move further into 'a fourth industrial revolution' (e.g. Murphy, 2017) and hyper-industrial capitalism (Abbinnett, 2021).

Julier (2017: 11ff) points to related cultural circuits of design goods and services, new forms of commodities and commodity relations, and to the construction of new spatial forms. He goes on to diagram relations between domains of design culture, around design object, space and image to economies of design factors, regarding roles and activities of the designer, consumption and production. He also reminds us that design also makes 'economic imaginaries' (Julier, 2017: 173), though we rarely see these in design and foresight futures. He concludes, saying 'Making the material and informational infrastructures, the systems of power or the financial logics of economies of design visible and knowable might also be one of the tasks of design practice itself.' (Julier, 2017: 177).

These arguments are taken up in 'Keeping the system going: Social design and the reproduction of inequalities in neoliberal times' (Julier & Kimbell, 2019). Central to this article is the argument that approaches and practices of social design that seeks to address matters of societal and individual need and well-being may benefit from austerity measures and the delegation and outsourcing of responsibility to diverse non-state actors motivated primarily by financial gain. They argue that social design cannot as configured address the causes and consequences of inequalities (Julier & Kimble, 2019: online). Needed, they propose, are social designers who are accountable to their publics; designers may adopt a mix and range of roles; and inventive methods may be activated to address actual paths to meeting structural inequalities.

Underpinning these recommendations is motivation to actively alter conditions and contexts of social futures. This differs, for example, from Manzini's work on social innovation where structural inequalities are perhaps underdiscussed. Similarly in calls for 'a green economy', for practices of 'reuse, repair, recycle' and support for regenerative systems in a circular economy model (e.g. Stahel, 2019), what is often absent is attention to the underlying logics of capitalist exchange, and its foundations and insinuated assumptions in design making and consumption. Circular economic models, like 'design thinking' has been marketed by business schools and consultancies, have been promoted as remedies for challenges to environmental damage. However, such marketing has typically maintained growth based logics (see Lacy et al., 2020) while arguing that recycling is contained with a circular system whose underpinnings remain undisclosed [→ SEE FEATURE 5].

In contrast calls for degrowth (e.g. Kallis et al., 2020) work with explicit exposure of the contradictions of exponential extraction and consumption, driven by the marketing of goods and appetites, services and experiences. They offer alternatives of slower

living and a recalibration of sustainability, values and care. Alexiou et al. (2022) present means to realising the design potential of community groups in context, in which value is cast as design capital connected to community capacities for working with a network of environmental, social and political-economic issues. They conclude in considering design education in which:

> … the capability approach draws explicit attention away from a singular preoccupation with design skills (such as visual skills, creativity, or design thinking) to an equally important preoccupation with the structures (environments, opportunities) that help individuals develop their own value systems and practices by recognising their diverse capabilities (see Strickfaden et al., 2006).

From economics, The 'Doughnut Economics' model by Raworth (2018) seeks to secure social well-being together with planetary ecological boundaries and generate a safe place for future living beyond disposable presents. Designing for a circular economy has been taken up by Evans and Münster (2021, 2022) in two conversational pieces centred on tips and pragmatic means for supporting sustainable futures and practices in effecting design in circular economic models and approaches. In 'Designing for what? Approaching necessary production and consumption for a circular economy', Ortega Alvarado and Pettersen (2022:2) write that:

> design to advance a CE [circular economy]should focus on more than products – which is an aspect that could also contribute to the general discourse and practice of CE, integrating discussions about technologies and consumption (Schröder et al., 2019). The point is not to leave products outside the debate but to question what is produced and why (Genovese & Pansera, 2021), to contribute to making the discussion on material circularity and its social effects more fruitful. (Ortega Alvarado & Pettersen, 2022: 2).

Questioning the premises, assumptions and limits of circular economy approach is taken up by Korhonen et al. (2018). They argue that the concept is a mixed bag of aspects that they try to clarify with reference to sustainable development and environmental sustainability. Their motivation is to provide more rigorous framing for uptake by business and policy sectors where sustainability is central. Corvellec et al. (2021) provide a most comprehensive survey of literature that reveals the circular economy to be based on technical and economic premises and that it amounts to what they charge as a questionable definitional quagmire on theoretical,, practical and ideological levels (the enticing circular metaphor being one) if it is to be useful for application and support for sustainable development. They conclude (Corvellec et al., 20221: online) that such:

> … a pathway toward circularity would be a circular economy that is modest, not a panacea but an actual solution to actual problems; concrete, in the sense of being clear about which kind of circularity it sets up and the goal conflicts that it entails; inclusive, in that it takes energy, people, and waste on a global scale into consideration; and transparent, in

the sense of being accountable for its achievements and shortcomings, not the least when it comes to economic, social, and environmental changes. Otherwise, the circular economy risks turning into a hypothetico-normative (but self-serving) utopia that derails actual and well-intended efforts to reorganise production, consumption, and more generally material flows in ways that are more respectful of planetary boundaries and that work in favour of sustainability.

Sentiments such as these are echoed by Vettese and Pendergrass (2022) is an explicitly socialist utopian preference for shaping futures. They conclude that :

Neoliberals blithely risk devastation to nature and society alike in order to protect the sacred market from the grubby control of mere mortals. Yet the Biosphere 2 fiasco demonstrated that a natural climate and a stable biosphere not only are irreplaceable preconditions for survival but are vastly more complex than we will ever know and can never be controlled. Half-Earth socialism would maintain and enhance the biosphere through abolishing animal husbandry, rebuilding cities, and rewilding at least half the planet. In such a future, we would have equality, leisure, health, and economic democracy – all utopian achievements worth fighting for in themselves rather than forced upon us by the environmental crisis. Consumerism is the golden shackle that must be cut to achieve true freedom. (Vettese & Pendergrass, 2022: 167-168).

For design students and teachers further work on shaping futures relations between sustainability and systems views in and on and through design would benefit from looking at an array of views on reconfiguring design centred political economies. It will also need closer collaboration not just with business schools and trend-driven approaches to innovation but to work in economics and political science.

Two examples

Next we look at two recent examples, one from economics and one for business, and discuss them in terms of design futures literacies. First, Mazzucato (2018: 270), in chapter on 'The economics of hope' in her book *The Value of Everything*, writes that 'It is not enough to argue for less value extraction and more value creation. First, "value", a term that once lay at the heart of economic thinking, must be revived and better understood'.

Mazzucato (2021: 204ff) outlines ways to change capitalism as dependent on that we 'reimagine government as a prerequisite for restructuring capitalism in a way that is inclusive, sustainable and driven by innovation'. She elaborates that this demands a symbiotic 'bringing purpose to the core of governance and taking a very broad stakeholder position across the economy'. She goes on to argue that governments ned to work with the willing and to invest in competencies and confidence strategies and building that is driven by public and business purpose in which social missions are not confused with technological ones. To achieve this, she argues, new aesthetics are need to motivate and to inspire as much as to enact experiential and collective change.

Perspectives on systems views towards design futures

BY Palak Dudani & Corbin Raymond

Let's start by grounding ourselves in our views on Systems Oriented Design (S.O.D.). How have we understood it for our work and what contributions does it make?

Corbin: Systems Oriented Design is a way-find process that consists of a compositional approach that takes into account multiple processes, views, skills, and synthesises the relational affordance of information as design material. This design material is then processed through visual layering by means of maps and activities of mapping and charting to inform a narrative-based inquiry into matters of complexity. These narratives lean towards cultural perspectives and world views, and are often complemented by collaborative processes, such as co-mapping. A SOD approach acknowledges existing spatio-temporal systems and tries to explore how existing systems that inform a problem might change. These changes are negotiated, mediated and discussed through applied design practice and systems thinking by design.

Palak: I have a similar view on SOD, especially with narrative based inquiry where I explore how cultural as design material can support our work with complex systems. I take a soft systems view (Nold, 2021) which understands complex systems are dynamic, indeterminate, always in-flux and fundamentally unknowable in the 'the hard-systems fully mappable' kind of way. My overall SOD approach is influenced by Escobar's (2018) view on pluralistic futures, Vaughan's (2018) approach to 'care', and the ongoing research within Anticipation Studies (e.g. Poli, 2013; Celi & Morrison, 2018).

In my previous work, I've explored the use of narrative via metaphors (Lakoff & Johnson, 1980) in order to bring in a more cultural, place-based and qualitatively rich view into the analysis of existing systemic complexities, contexts and conditions (Dudani, 2021). By curating and coding place-based narratives into everyday culturally relevant metaphors, we're able to materialise the hyper-local, embodied and experiential elements and play with them to reveal invisible logics and explore radical alternatives among others, including futures.

What is our view on the matter of sustainability? Are we viewing it as a desired end-state or as part of a process philosophy on preferred, possible or plausible futures?

Corbin: I think that sustainability is entangled with futures when framed in relation to climate futures. If we take a step back and look at the SDGs for example, we see that from present day to 2030, it has a futures focus.

Futures, framed from Design Studies, are conceptualised as plural and are entangled in concepts of multiplicities. Thereby, I see the SDGs as a refractive and reflective representation of multiplicities and plurality. The SDGs offer interrelated, combinatorial directions (17) and pathways (169), in how to approach climate futures that are framed with a socio-ecological framework.

Renata Tyscyk, who writes on Climate Change and Culture (Tyszczuk, 2019: 20), offers a reflection that climate scientists position matters of sustainability through predictive climate-modelling, such as rainfall forecasts based on scientific data towards the year 2100. The SDGs, in comparison, do not take a predictive approach on sustainability. Instead shifts to what Renate calls pathways. This leaves room for relational approaches to offer navigational means towards sustainability, and thereby (climate) futures.

Critique on the SDGs has been on how attainable sustainability might be by 2030 and there are concerns on how we might measure and evaluate our collective efforts to reshape and reorient our shared futures in this sense.

I believe that if we aim at evaluating sustainability and matters of futures as outcome-based then we might experience frustrations of how to assess, measure and evaluate our collective efforts. So how then do we adopt a process-based orientation to sustainability and not an outcome-based orientation?

Palak: When I hear of SDGs, it reminds me of my general ambivalence towards the global universal metrics and timelines against which countries and their progress gets measured.

In terms of the global events that have happened over the centuries, not all countries have experienced climate change or the horrors of time the same way.

This is a rather blanket reflection on how in global stage and public discourse, countries from Global North and Global South are measured against the same standard while not acknowledging that many of those countries in Global South have had a completely different timeline in terms their political autonomy on resource use (see colonialism) and present stage of infrastructural development.

For example, in COP26 Climate Summit, India came under criticism from US and other developed nations, for not agreeing to 'phase out' fossil fuels but 'phase down' (BBC Asia, 2021). This view, widely publicised in popular media outlets, of course, failed to acknowledge how developed nations historically have one of the highest per capita emissions and comparatively are now better placed to access alternative fuel resources.

Talking about sustainability and how it might relate to futures – with an 's' – needs to acknowledge that climate futures of Norway for example, are not the same as those of India.

The process and philosophies of 'preferred, desirable and possible futures' needs to be birthed from the same land as the people doing the work of imagining these futures, for them to be truly commensurable with histories and lived realities of that place.

How do we interpret anticipatory design and futures in relation to our view on SOD? What implications do we see for design literacies and pedagogies?

Palak: Before we deep dive into this question, I am curious about something you said earlier Corbin, about your use of pathways as a metaphor for matters of sustainability. You'd used this to describe the SDGs and while the SDGs themselves are highly overlapping

When we use paths to describe individual SDGs, what happens when these intersect and interconnect?

Do these paths meet, converge, interact, like dirt paths which become worn and solid from repeated walking, but quickly shift as people's paths move, change and meander?

What distinguishes a path and its boundaries?

Corbin: Futures take up matters of plurality, relationality, and orients towards navigational performativity. I see Futures as being in a state of flow, that is relational and not only directional.

As you mentioned, this navigational spatio-temporal analogy is somewhat similar to walking across an open field many times – the action of navigation forms a dialogue with creating topologies by changing the landscape over time. An unclear path over time being carved for others to follow – in a similar way disciplines such as futures studies and design studies have done over time. It is like path-setting. Making it easier for others to do the wayfinding through uncertain landscapes and terrains.

Palak: I love this view on Futures being 'relational and not just directional'. For me, it really opens up questions around 'futuring' and connects to the larger ongoing conversation on design futures.

The tools, methods and process we use to imagine, articulate, shape and produce these 'designed' futures, many of these have deep legacies in certain disciplines. For example, popular futuring tools like customer roadmapping, service blueprinting, forecasting, 3 Horizon's mapping, most of them are overwhelmingly from the disciplines of Business and Management, while our everyday design language of deadline and targets among others.

There are certain views, values and positions embedded within these tools. Different disciplines have attitudes and inclinations as to how they look at and engage with the concept of 'future'. For example, e.g., Military and Defence, might have a more aggressive, controlling bent towards Future, whereas Business folks might see Future as something to be planned so as to reduce risks, to mitigate damage and keep things predictable and navigable.

An anticipatory view on Futures allows for a less fearful, adversarial attitude towards Futures. With its approach of 'taking care ahead of time' (Morrison, 2019) it makes space for a more open, playful, and curious view, one that doesn't embody a fearful emotion that seeks to dominate or control The Future, but to explore possibilities of many futures, and what all they might be.

This along with SOD makes it possible to explore plurality of things and play with notions of future which are more open-ended and hopeful – a mindset that also comes across in the tools and methods we can use in our design work.

Corbin: I agree with this and want to add by saying that SOD in its own way asks whose futures and who is doing the futuring – and takes on collaborative and participative practices, such as co-mapping – often leading to explorative modes of stakeholder inclusion by identifying missing relations to implement anticipatory futures concepts.

By this SOD points to a means of implementation that does not only sit within think-tanks, but also do-tanks. Other disciplines of design do this as well but through SOD actor engagement happens in relational, mediational and negotiated means.

So how might we mediate and negotiate futures by design through anticipatory practices?

SOD is perhaps one of many approaches to doing this by design. And might inform ways of identifying actors needed that might otherwise be missing in key decision-making processes in conceptual and implementation phases.

Again, to ask, who is doing the futuring? But perhaps pointing more to "how".

Whose futures are we talking about and how might S.O.D. intersect with them?

Palak: Whose futures – yes! It allows us to question who is doing the designing, researching and who is being researched, making it possible to interrogate the role of design in humanising some people at the expense of dehumanising others. As van Amstel (2022) puts it 'it is already well established that design research can humanise Things and, in turn, humanise humans. However, there is still a long path to admit that design research can also dehumanise people and nations.'

A lot of design disciplines today are heavily influenced by Design Thinking which was imported from Silicon Valley and found application in world over without much critical thought to context (Ansari, 2016). Re-humanising design allows us to discuss the extractive tendencies of design research and knowledge production.
Connecting SOD with Anticipatory Design makes space for bringing decolonial views into our design practice, to have these conversations on our tools and processes, as you said, training designers differently.

This connects with my soft-systems sociocultural view I mentioned earlier. One of the main aspects to that is a departure from the mapping as a way of knowing – my position is that we cannot map everything that exists, not because there is just too much to map, but because of fundamental unknowability of things.

When we map, we map our own view, based on our positionality. These views will produce very different mappings, all real and true in their right but very different at the same time.

How do we then work with plurality if we can't acknowledge the unknowability?

If we are so different and many, we should be able to think about the world where different visions of the future might exist. For design literacies it means building tools and processes that allow us to question these worlds and their embedded legacies, so we can make up our own words and tools, and shape alternative futures.

This is exactly what Andrew and I have worked together on in FUEL4DESIGN where for example the module of Lexicon we've created exercises, interactive tools and workshops to prompt design students,

researchers and practitioners in exploring unmaking and remaking of words and worlds. NEOLOGISER is a great example were students have to reflect on the 'meaning-making' capacity of words, their influence their projects and how they can be reassembled and re-made into new words with new meanings. BALLUSION workshop plays with the unknowability of futures and used balloons as a metaphor for futures which might be stretchable, malleable and could burst anytime, brining strange new words that might impact the present. Taking a meta view, we've explored how we can question and unpack our existing tools and create new ones, to make it possible for us to work in new ways and shape all kinds of different futures.

Corbin: This opens up SOD to take up matters of futures and anticipation working towards scenario building, and cultural knowledge as material, an emergent practice of design that is underdeveloped in SOD pedagogy.

I think that navigating this cultural knowledge as rich design material informs speculation, transformation and could be critically informed by languaging or speaking to, of, from, and through systems views from different world views. I think with systemic design this is generally implied. In my opinion, working with time as sociocultural material is a new form of working with temporal matter in practice. Finding socio-temporal relations to open up cultural imaginaries and diversifying the inclusion of actors may just help to identify different collaborative and shared futures. SOD does not explicitly express this ….

Palak: But makes space and creates conditions for!

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PoliMi PhD project

YEAR: 2022

TEACHER: Manuela Celi

STUDENTS: Alice Paracolli, Federica Rubino, Xiaoyang Zhao, Wo Meijer, Vera van der Burg

TAGS: Unlearning. Non-human. Decolonisation.

Mother G[AI]a: A Journey to Earth-Centred AI

An earth-centred perspective for decolonising AI, this group created a series of scenarios starting from the counterfactual premise that the creator of the first computer, based his programming theories on the Hypothesis of Gaia, which sees earth as a system that helps maintaining the conditions for life on the planet. The output is a story, told as one of the inhabitants; Gathii, a wonderer, tells us about his life and how human's relationship with Gaia evolved and change through time, stopping on places, border conceptions, food and objects. Supporting itself with a series of visual montages, the story develops on how Gathii's journey ends with an important lesson, how human's attitude towards earth evolves and transforms providing insight on the future of our relationship with it.

Team 4 - Design in time of Crises   Conclusions

FUEL4DESIGN   FUTURES DESIGN TOOLKIT

In concluding a debate type contribution entitled 'Design value versus design values: From mission-oriented innovation to ecosystem enabling', Cooper (2021: 53) refers to a Value Matrix developed by the designers and architects of EcoResponsive Environments (**Link** ↗). Also, Pointing to the writing of Rowarth and Mazzucato as having their critics and also not having offered radical alternatives, Cooper (2021: 54) makes a shift from Mazzucato's 'moon mission' mode of innovation to argue for one that is enabling of ecosystems:

> *Thus, innovation in this system is not purely innovation to drive an economy, but innovation to improve society without damaging the planet. Design in this system draws deeply on its 'systems', holistic, interdisciplinary approach to imagine what could be, to deliver against common values in a collaborative economy. The challenge as always is to determine what the common values are and how to deliver against them, something that is more achievable at a small scale than on a global scale, as COP26 illustrates. However fundamentally, the next generation of designers must be trained to enable 'Values' driven design.*

A collaboration economy that seeks environmentally driven shared common values are labelled the commons (Berlant, 2006). The commons is neither bound to spatial nor temporal elements and might equally apply to shared natural resources such as rivers, groundwater, and rainfall, or knowledge, sensing, and pasts, presents and futures (Brousseau et al., 2012).

The commons fundamentally implies the ethics of collaborative innovations and practices towards sustainability. When this view of the commons is brought forward in relation to political economies, collaborative conduct has been labelled 'collaborative governance' (Brousseau et al., 2012). Greenwood, et al. (2021:76) in their recent book structure collaborative governance. The Four stages are assessment, design and organisation, deliberation and decision-making, and implementation and adaptation.

This is a collaborative governance framework presented as a step-by-step practical process guideline to optimise collective action in multi-stakeholder groups. The framework brings attention to collaborative indicators to explore problem areas, organisational elements to optimise multi-stakeholder engagement, focus areas towards joint learning and collective imaginaries, as well as collective action through key activities. This framework is a practical guide to Collaborative Governance where the affordance of collaboration is what Greenwood et al. argue for as a platform for collective action (2021:4).

When designing common values, within the commons that are beyond the fence of the collaborating actors who compete against each other in the governing economic model, collaborative governance offers a modality of collaboration from conceptualising to implementation. Design moves through a similar design process and perhaps we could ask: How might we as design practitioners, researchers, educators and students then design with, for and through our common values of sustainability

with the environment as the commons, or better yet, the future as commons? And could we turn to modes of collaborating on shaping these futures through the modality of collaborative governance?

Second, in *Expand: Stretching the future by design*, Skibsted and Bason (2022) draw on a diversity of work in business and innovation largely centred in Denmark to argue that a set of six design principles can be enacted to help extend the role of 'design thinking' as assumed today and reach beyond notions of human-centred design to 'expansive thinking' that is multidimensional.

They argue that to meet the many challenges of today (and tomorrow) that we need to engage design differently. By this they mean that we need to expand design beyond design and work with an extended view as 'for more than a quartet of a century the world has been mesmerised by a monolithic and deeply ideological approach to innovation, technology and design that all but denies our agency in making the world' (Skibsted & Bason, (2022: 9). They counter that:

> *Expansive thinking means imagining alternative futures and going beyond the safe, stale, and culturally determined mindsets that typically take root in existing systems, sectors and organisations. It means innovating on a more systemic level, figuring out what people, communities and ecosystems need as a whole, and testing, improving, and scaling new approaches. Expansive thinking means challenging assumptions and preventing intellectual inertia. (Skibsted & Bason, 2022: 18).*

Underpinning these claims and their own business-innovation change approach, are six ways of thinking about the role of design and innovation in pushing beyond typical world views to support change makers of the future. These are centred on Time, Proximity, Life, Value, Dimensions and Sectors.

Each of these views, in keeping with the book's business and popular market, is almost entirely supported by contemporary media references with little mention of research Futures Studies or Design. However, it represents the type of publication, with strong arguments, illustrations and cases that our master's students in design in particular are likely to meet and continue to meet. From the dynamics of our LEXICON and PILLs in FUEL4DESIGN, this is a book whose claims could well be deconstructed by students in activities to more clearly locate and position the propositions and values of their own design futures projects.

Across and through the FUEL4DESIGN project we have invited and engaged participants to follow such positioning and to unpack prevailing programmatic thinking and preferred models [→ SEE **FEATURE 6**]. However, engaging in design's embeddedness in political economies also demands further thinking and motivated action.

We see that this is about who's world is being steered or shaped by which values and whose experience of the 'common good' as Mazzucato argues for (see also Ostrom et al., 2012). It is also a matter of who is steering these collective drives, experiences and

outcomes in macro-educational as much as macro-economic terms, cross-hatching difficult matters of close analysis, clarification of interests and consequences, redistribution regarding wealth creation, access and abundance, amongst others.

Some future pathways

We close this section with a few pointers to recent design education and regenerative futures work. In FEATURE 6 we include a dialogue between two designer-researchers who have been part of FUEL4DESIGN. From India and South Africa, they have studied and worked in Norway, and draw on shared experiences from their own master's design education and situated practices in a discussion on futures design, sustainability and systems. This conversational reflection complements recently published material to which we now turn. Links between systemic and multidisciplinary design education and training are taken up by Peruccio et al. (2019) with critical consciences and working with circular economy approaches to rural innovation in Europe in the MULTITRACES project (**Link** ↗) funded by ERASMUS+ (Aulisio et al., 2021). Most recently, Camrass (2023, in press) outlines a set of principles for regenerative futures that provide design education with sustainability-systems 'touchpoints' for future work:

> *Principle 1: Regenerative practice starts with a story of place that considers nested human and natural systems and incorporates a layered understanding of reality and time.*
>
> *Principle 2: A story of place can be deepened by examining the systems, world views and myth/metaphors that support them.*
>
> *Principle 3: Definitions of regeneration are place specific and goals and success measures should be collaboratively developed.*
>
> *Principle 4: Creating a shared image of and metaphor for a community's desired future is an important early step*
>
> *Principle 5: Futures methods including CLA are important to examine and deconstruct this image, identifying assumptions and used futures*
>
> *Principle 6: Backward mapping from a desired regenerative future is important, but his map should by dynamic, responsive and evolve with the systems in which a community is situated.*
>
> *Principle 7: Co-evolution of human and natural systems is the cornerstone of regenerative thinking and practice.*
>
> *Principle 8: A commitment to internal, self-regeneration should be continuously cultivated.*

The many crises we face expose principles and the key matters addressed above as being outcomes of underlying systemic value infrastructures and policies that work against long-term survivable futures. These need to be enacted as emergent design futures literacies [Figure 4] that go beyond surface aesthetics or the promotion of participation without deeper understanding and ethical pedagogical responses from design educators and researchers (e.g. Pereno et al., 2022). This points to our own roles and changing knowledge generation and application as educators and professionals.

◀ **Figure 4**
A functioning
L0 prototype
showing the
structure of
the base and
adjustable
head with vision
sensor and LED
light. (Zou, 2020).

7. CONCLUSIONS

BY Andrew Morrison & Palak Dudani
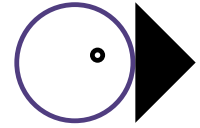
Beyond 'well-oiled pedagogies'

Given the experience of FUEL4DESIGN, other projects and teaching, as well as the material covered above, two questions arise concerning making relation connections between sustainability, anticipatory systems research, Systems Oriented Design and cultural takes on sustainable anticipatory systems oriented design. First: Why is such framing needed for working with design, futures and learning and their conceptualisations as literacies and pedagogies? Second: How may relational ontological framings assist us in supporting futures in and as learning and teaching where attention is to ecological, durable, participative and systemically responsible, democratic futures?

In addressing these questions pedagogically, for master's and doctoral education in a futures design literacies view, we need to engage in ways to support students to counter and perceive futures beyond assumed views and to work against institutionalised resistance to change. As our own PILLS offer, this is about processes of learning how to chart and select perspectives and positions so as to work with different conceptualisations of design and to be open to modes of becoming not just being. Attention to related vocabularies and their rhetorical and discursive uses needs to be positioned in relation to wider ones of sustainability and systems. Our inclusion of tools and methods and concern with mode of scouting futures with focus on experience and affect, all suggest ways to enact at design futures literacies and pedagogies.

However, working with students and our own changing literacies has suggested that more attention need to be given to the world views and methods entailed in sustainability and systems approaches broadly, but also in terms of their articulations and manifestation in designing that communicates and distributes these further societally, professionally and in terms of values and potentials for long-term futures. These concerns and our activities still resonate with Papanek's assertion that design can have purposeful and meaningful social uses beyond surface aesthetics and growth-driven consumerism. They also find echoes in his later work on locating such socially innovative design in terms of human scale (Papanek, 1984) and calls for an ecological shift in connecting, not separating, relations between design and nature (Papanek, 1995).

We need to do this as counter-pedagogies to world views and practices that perpetuate privilege and constrain diversity, equity and identities on the part of students and teachers who cannot not work with design futures.

We need counter-pedagogies because our existing pedagogies have been informed by, created from, have embedded within Eurocentric-neoliberal-exclusionary ways of seeing, understanding and shaping the world - a world that's not fit for the future. At AHO the related 'Refuturing Studio' has worked towards similar ends (Joseph, 2021) and as is illustrated across this book in the work of Joseph (2023). In these endeavours and experiments, we need to actively work against existing strong currents within our pedagogical spaces because current pedagogies are not conducive to shaping the kind of world we need to be designing towards.

For Benjamin (2015: 218), 'What exists exists in relation'. This applies to design when effects come into being through networks and the working of relations and through relations themselves, Benjamin (2015: 34) writes '… relationality cannot be separated from the modes of instantiation in which it occurs.' Such a view is apparent in three recent publications in design inquiry that focus on whose views, voices and 'representations' are being conveyed and in which socio-material practices and mediations. Agid and Akama (2018) motivate for multiple perspectives and dynamics for different participants in Service Design, a kind of dance of position, relation and movement in rethinking framings of the domain. In the 2021 Pivot Conference Dismantling /Reassembling, Lima (2021) argues for greater attention to relationality in design beyond Eurocentric views and via dialogue between lived and professional experiences as a mode of decolonising design enterprise via relational accountability. In 'A family of sensibilities: Toward a relational design practice grounded in materiality and embodiment', Diatta et al. (2022) provide a set of vignettes as a mode of performative design writing, that links embodiment and sense-making, as part of a relational poetic method for analysing social practices.

Brassett and O'Reilley (2021: 6) argue, referring to Deleuze and Guattari and to the work of Stengers, that 'A future can only be made to come here, to the present, if we open ourselves to the possibilities that we, here, now, our "immediate existence", may be recreated by the arrival of the "people yet to come"'. In the increasingly compressed context of climate change and the COVID-19 global pandemic and its fallouts, humankind has experienced a dystopian and immediate version of existence and systems in the present of what we thought might happen in a rather more far-flung future (FEATURE 7). Such a future is one whose occurrence we might push even further away from our quotidian lives, in acts of psychological displacement, by performing organisational detachment and submitting to political delays.

For design students and teachers, the increasingly compacted nature of co-occurring crises, a mesh of diverse and related matters and effects and experiences, has been an acute rupture from known and expected pedagogical practices and their aspirational trajectories. We have been jettisoned into design pedagogies radically different from the conviviality of studio activity and in-house learning through making, and from access to workshops and labs, libraries and lectures. Everyone has experienced, in terms of learning and teaching, separation from physical materials and embodied experiential learning. This experience has included us all in a local and global world of crisis in which we've needed to recreate entire pedagogies by designing design learning differently. The responsive digital and distributed forms we have deployed have

made it impossible not to rethink the core of our educational and designerly activities. Intersecting complexities and crises have forced us to find pedagogical responses to their systemic, structural and organisational assumptions and dynamics.

In reflection, we suggest we need to infuse design, sustainability and systems with anticipatory thinking and designing by anticipatory principles and practices, where small actions may work heuristically to project larger choices. We hope that these modest gestures and situated activities might further inform and motivate the fulfilment of cultural aspects of shaping futures through design learning and in placing futures in learning design. However, this demands we attend to matters of scale and power: small interventions need to spread, and to work as catalysers of bigger actions. They ought to connect to the needs and energies of communities and movements, changing business models and form policies that look beyond short-term expediency.

Opening paths for learning in compounded crises

With hard scientific evidence now incontrovertibly stating that we have less than a decade to avert and avoid the irreversible consequences of rises in temperature beyond 1.5 to 2 degrees Celsius, design has urgent work to acknowledge its complicity in contributing to systemic environmental damage. As teachers and students, future professionals and anticipatory design researchers, we will continue to critically imagine and to collaboratively implement design work that offers unexpected, clear and critical options together with persuasive and performative actions. These ongoing ventures and experiments will also need to take place through dialogue and partnerships with industry and to contribute actively to policies and futures governance.

Design schools operate in privileged spaces in that they can experiment and suggest, stretch ideas and tease out methods and materials experimentally. They are spaces for learning and exploring, not only conforming and repeating. Their very dynamics of knowledge shaping and exchanging - of artifacts and processes, experiences and effects – are possible because of the vibrancy of their relational activities in process, and as outcomes.

These are creative-critical in essence, spanning human and non-human, technical, virtual and bio-ecological, and they are entangled in sustainable-systems relations. Such relations are already entangled in the past and in the future as we enact design futures literacies in a plurality of anticipatory acts of shaping and exchanging knowledge, through dynamics and intersections of making-analysing. Recently, Faludi et al. (2023) provided an extensive charting of curricular components that a design educational future programme might include that draws together sustainability key concerns, practice, expertise and design that is also linked with systems views. Such a charting provides design educators and students with an elaboration of components and relations but not transactional design anticipatory practices or sets of linked analyses. We have much 'constructive' work to do, and collaboratively so across design domains, schools and settings, not all affluent or western, for connected and durative change.

Our anticipatory design literacies and pedagogies make manifest, embody and are sites of sustainable design change and their systemic design materialisation. They are realised as we work to shape schema and scaffolding, proto-and provo-types, emergent and distant scenarios returned to the thickness of our present contexts, and options for thinking and working with futures for different futures. While these include macro matters of political economy, they also require attention to design tools and techniques, probes and design fictive imaginaries that are linked to actual shared decision-making processes in the present are a few of the ways we already work and can use as pre and pro-figurations of anticipatory designing through which to expand our futures-in-design repertoires. Such anticipatory work connected to sustainability and systems, needs to be made apparent and to be accessed. It needs to flow and to circulate. It needs to surprise and inform and motivate and energise. And it needs not to always critically resolve or solve but to remain open and to offer possible, motivational and workable means to preferred futures.

In summary, in this current period with acute need for systemic responses and fundamental changes to dependencies on fossil fuels and unbridled modes of consumerism, design education institutions ought to be more fully galvanising their collective powers of imagination, commerce, communication and criticality to offer visible and actionable alternatives. It is now imperative that we do so as the window for averting environmental and human and non-human disaster that will have irreversible consequences.

Anticipatory Design thus needs to engage in design futures literacies that are about more than world views and articulations, methods and prospective projects. It must turn its critical practices to how to engage communicatively with values and expectations and the psychology and behavioural modifications involved in shaping sector, institutional and societal changes for design works across and within these different scales. This means tackling complex and chewy matters of sustainability, systems and cultures of designing in relational ways, we suggest, and for continuing to strive for learners', professionals' and citizens' engagement in working towards collaboratively shaped, long-term, sustainable futures.

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TIME, DESIGN AND ANTICIPATORY LEARNING

BY Andrew Morrison & Corbin Raymond

WITH Oscar Tomico, Guim Espelt Estopà, Jana Tothill, Roger Guilemany, Mariana Quintero & Manuela Celi

1.
Introduction

BY Andrew Morrison & Corbin Raymond
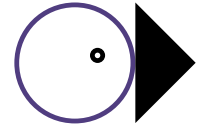
Shaping temporalities together in design futuring

Relations between design and time

In working towards the original funding application for FUEL4DESIGN, and then in the processes of the project taking shape in the context of climate change crisis and COVID-19 global pandemic amongst others, relations between design and time have been central. This has been the case in the focus of the work packages but also in their sequentiality, development and overlaps. From the many students and colleagues, we have engaged with over design futures literacies, time has been a recurring topic. In contributions and collaborations on the project, we have increasingly become more certain of the centrality of time, its central role and interconnectedness - creatively, pedagogically and critically - with deeper and wider systemic matters of design that need to rapidly and carefully engage in the multiple dynamics of anticipatory change.

It is important for design educators and learners to be aware of different ways time is conceptualised and framed in different disciplines and domains because understanding these various perspectives can help to inform design processes. Design Futures Literacies are fundamentally temporal, as the term futures suggests. However, futures iniquities and design and a futures shaping activity in essence need to be more fully discussed as chronotopic literacies. These are literacies that address matters of socially emergent configurations and working of relations between space and time.

In the field of Futures Studies, time is often characterised as a key factor in understanding and predicting future trends and developments. Futures Studies aims to understand and anticipate the long-term implications of current and emerging trends, and this requires a deep understanding of how time is conceptualised and framed within different disciplines and domains. For example, in Economics, time is often viewed in terms of opportunity cost, or the value of the next best alternative that is given up as a result of a decision. This perspective can inform the design of products and services that are efficient and effective in terms of how they use time and resources.

In the Physical Sciences, time is often viewed in terms of physical laws and principles (e.g. Rovelli, 2017), such as the laws of thermodynamics and the concept of entropy. This perspective can inform the design of products and services that are sustainable and efficient in terms of their impact on the environment. In the Social Sciences, time is

often conceptualised in terms of social norms and expectations, such as how different cultures view the concept of time and how this impacts decision-making and behavior. This perspective can inform the design of products and services that are culturally sensitive and appropriate.

In all of these aspects, we need to consider and investigate 'The complexity of educational time' (Alhadeff-Jones, 2017: 2) through futures enriched pedagogical takes on designing and design researching. Alhadeff-Jones (2017: 3) reminds us that education is '…shaped by the heterogeneous, complementary, antagonistic and contradictory temporalities that rhythm the activity and the life of learners, educators, institutions, society and knowledge itself. Education also determines the way we learn to relate to time and the heterogeneous rhythms of existence.' Such rhythms point to the interplay of the temporal and spatial, not their separation (May & Thrift, 2001).

In framing time as dynamic and plural, that is a engaged with occupying time through interactions (Mazé, 2007), design pedagogies need to engage with what Mazé (2016) calls a temporal politics of making a difference. In the context of discussing relations between design, futures and anthropology, she writes that 'The future – not empty but open – should not be merely a design rhetoric, a scientific "no man's land" or a place/time for occupation by policy, planning and design. Instead we should engage profoundly, and together, in our ideas and politics of future-making.' (Mazé, 2016: Kindle). Time is central to the many aspects and practices of future-making by design.

Such futures making through designing is now embedded in what is in effect a less geologically, more temporally framed planetary epoch, namely the Anthropocene. Whether critiquing the name of the epoch or its focus (e.g. Harraway, 2015), we need to work with changing understanding of human-non-human relations to time and to planetary level survival and the role of human designing, form planning to policies, through our design disciplinary pedagogies and practices amongst others. What is at stake, write McNeill and Engeleke (2015) is a deeper understanding of tensions between 'the great acceleration', especially in the second half of the 20th century, of our planning, extraction of physical resources, and models of growth and consumption as temporally enacted and deeper planetary time that will outlast our seemingly controlled human 'mastery', but actual instigated damage to planetary ecologies. For McNeill and Engelke (2015: 211), 'Now that climate is less stable and the Earth system is charting a new course never experienced before, thought and institutions will evolve in new directions more compatible with the Anthropocene. Since we cannot exit the Anthropocene, we will adjust to it, one way or another.'

We are already, and rapidly, embroiled within violent, unpredictable and costly consequences - ecological, human and economic - of climate change. Clark and Szerszynski (2020) implore us to address a planetary level of social thinking where our disciplinary certitudes of earlier times are not merely acknowledged as threatened but need to be rethought, and urgently so, and where such thought is in the making, so too must design pedagogy engage in rethinking the temporal in design inquiry, pedagogy and professional practice. They write that.

While the condition of being imperfectly informed is not an excuse for inaction or dithering, it is suggestive that – alongside urgency – responsibility also calls for patient, searching, reflective modes of operation. As well as and often bound up with the time of decisiveness there is the time it takes to delve into origins, to reckon with inheritances, to imagine possible futures, to weigh up multiple options, to listen to objections and to convince others of chosen pathways (Barnett 2004; 2005). There are times of prospection and retrospection, of trial and error, of revision and trying yet again. (Clark & Szerszynski, 2020: Kindle edition).

All in all, design schools and professions need to engage actively with what Chakrabarty (2018) motivates for as pluralities of shaping 'anthropocene time'. We need to be active in rethinking our conceptions and understandings of time, where technocratic planning and determinism imprison the very creativity needed for designerly contributions to planetary survival.

By emphasising the cultural conceptualisation of time by viewing it from the social sciences, and focusing on critical, imaginative, and long-term sustainability, matters related to time's relational and multi-dimensional qualities arise. For instance, time is often closely tied to space, as events and activities occur in specific locations and at specific times. Time is also closely related to culture, as different cultures often have different norms and expectations around the concept of time and how it is used. Understanding these relational qualities of time can help designers to create designs that are sensitive to the context in which they will be used and that take into account the cultural and social norms of the users.

Across the scales of (design/ing) time

In relation to time's multi-dimensional scale, we need to only look towards and reflect on globalisation, digital media technologies and our experiences of related financial, environmental and the COVID-19 pandemic crises. Time has increasingly, and rapidly, come to be experienced in terms of contexts, conditions, and change. It has become at one blink more instant and pervasive, yet at another a vast expanse of deep challenge filled with perceived and unknown consequences. In reflecting on crises, catastrophes and temporalities, Antentas (2020: 319) observes that:

The crisis of the COVID-19 modifies the nature of presentism, since our extended and endless present has been abruptly invaded both by the past (the confinement and the virus evoke situations that we associate with the great pandemics of the past) and by the future (which suddenly appears in the form of an abyss and a catastrophe to come). The lockdown not only interrupts the normal flow of activity; it also interrupts the inertia of the present. With this, the inexorability of an inert future becomes frozen, and a scenario of bifurcations and contingencies opens up.

Design students and teachers have much to (re)consider concerning conceptual-isations and practices of working with time as a design material in the contexts of challenges of the pandemic and framings and working with the temporal in the climate

PoliMi PhD School

GROUP: 8

YEAR: 2022

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TAGS: Agency. Care. Time. Empowerment.

Infinity Cell

Infinity Cell's hand wearable device may control the cell renewal cycle inside your body, giving you the option of slowing it down to extend your lifespan, or speed it up to repair damaged tissue or body functions. It provides the wearer the flexibility of controlling their own life speed.

context of the Anthropocene . The Anthropocene is a contested term, bit in essence reaches beyond geological time to encompass an epoch in which human contributions to climate and planetary precarity and change are implicated in systems and non-human activity.

Ellis (2018), for example, provides historical contexts for the emergence of the term, reminding us that it is also concerned with new narratives of human-non-human and global systems relations that are in flux and where understanding the temporal and transformation are inescapably part of working to deflect and mitigate climate change and human and environmental planetary disaster.

Mentz (2019: 1) insists that in seeking justice, openness, difference and understanding the burgeoning publications and related events on the Anthropocene, 'What we need from this seething cauldron of rival terms and points of view is not a discourse of mastery—one 'cene to rule them all—but a route into plurality.' Engaging with such plurality asks that we are open to working with time as scale and as a mode of complex relational thinking and making. For Mentz (2019. 3, 'Among the key positive values of a pluralized Anthropocene are a flexible approach to scale, a capacity for dynamic speculative range, the ability to respond to catastrophic change, and self-reflexive curiosity.' Timescales become a key aspect of negotiating the plurality of the character and challenges of Anthropocene, of 'reading under Anthropocene conditions' (Mentz, 2019: 12; original italics), but also of writing our design futures via active, transformative shaping of design futures literacies and pedagogies.

In 'Across the scales of time: Artifacts, activities, and meanings in ecosocial systems', Lemke (2000) offers a framing of our temporal schema, practices and engagements, including the educational, arguing that we need to develop a wider system understanding of 'timescales', from micro to macro, momentary millisecond to millennial epoch. Lemke's work, two decades or so down the line now, remains highly applicable for elaborating further anticipatory design-learning perspectives and the roles and importance of attending to the temporal in shaping design futures literacies. More recently, timescales are taken up in the Environmental Humanities (e.g. Wiggin et al., 2020) as covered below.

In introducing their recent edited collection on *Working with Time in Qualitative Research* (Facer, Siebers & Smith, 2022a), and its application in the social sciences especially, Facer, Siebers and Smith (2022b: 22) note that 'The research process is drenched in time' and that 'Decisions about time also profoundly shape research design'. In terms of design and methodologies in futures literacies, we take up these matters in **Essay 7: Learning Design by Making Futures**.

Here we mirror these important observations on time and research: we are claiming that design processes and related analyses are temporally saturated and that the design of designing, artifacts and processes is deeply shaped by the temporal. In contrast to the primary focus of Facer and colleagues on methods and the methodological, in this subsection our concern is with the ontological. For Willis (2006) 'ontological designing' is:

(i) a hermeneutics of design concerned with the nature and of the agency of design, which understands design as a subject-decentred practice, acknowledging that things as well as people design, and following on from this, (ii) an argument for particular ways of going about design activity, especially in the contemporary context of unsustainability. This leads to a further implication: the theory of ontological designing carries with it a politics.

We see a need for an anticipatory design pedagogy perspective to map out perspectives on time and temporality. We see this as a core aspect of the 21st century and futures designing and designing futures education and research for the nurturing and strengthening of fuller, better prepared and critically imaginative long-term sustainable futures. In the widest sense, time needs to be acknowledged and disambiguated and connected due to its multi-dimensional and relational qualities and characteristics. For Hoffman (2022: Kindle):

> *We live in our bodies and psyches, in families, landscapes and nations; but, above all, we live in time. It is the one dimension of experience we cannot leap out of, at least until the final act will stop but we can contemplate it, investigate it, get acquainted with its nature and workings. Indeed, the need for reflection, for making sense of our transient condition, is time's paradoxical gift to us, and possibly the best consolation for its ultimate power. Time gives us our existential premise, and coming to terms with it is equivalent to grappling with the great questions.*

Our design pedagogies across a diversity of design schools globally seldom includes substantial inclusion perspectives and concepts concerning time. This is the case even though all design and all design pedagogy is inescapably located within emergent practices of working temporally in processes and transversally in terms of what we see as 'a designerly anticipatory chronotopics' (more on this later) of the inter-relatedness of past, present and future. This is all the more urgent in the context of the rapidly materialising climate crisis and deeper conceptual work on understanding design and designing in relation to what Chakrabarty (2018) has termed 'anthropocene time'. Concerning ecological crises, Bastian (2012) goes so far as to say that in 'telling the time' we are 'fatally confused'. A decade later, one might say that this is a state and condition that design education and learning designerly futures needs to face differently and actively reframe in order to act responsibly and productively for the short and long term.

In addressing time and anticipatory design education in urgent times and for unseen far futures, our focus on time has been influenced by the work of Adam (1998, 2004, 2008). It also draws on Adam and Groves' (2007) framings of the temporal that attends to time as a matter of future concern, with focus on relations between action, knowledge and ethics (see also Essay 3: Altering Prospective Design Pedagogies).

Focus and outline of essay

In FUEL4DESIGN, specific attention to the temporal in design futures learning, literacies, pedagogies and research was emphasised in the final work package that has

culminated in this book. In this resulting essay, we take a different turn to some of the other essays by offering a transdisciplinary research review of core work on time. We illustrate this with some of the material in the project, and in particular, a shared interest on time in design in close collaboration between project and work package leader and contributor, and supervisor and doctoral student. The chapter this draws on different aspects of time in linking theory and practice, and by way of examples of applied students' work from a PhD school arranged by PoliMi in Italy, a reflection by teachers' on one master's student project from ELISAVA in Spain, and one PhD at AHO in Norway with attention to time, scenarios and cultural contexts of working with wider matters of collaborative governance and transformation in South Africa.

Our motivation here is to indicate some of the ways the temporal may be addressed and understood in shaping design futures literacies in a diversity of ways. We do this to supplement focus on the temporal in the learning resources and events we developed, together with other contributions to this book and our related research publications. We also do this to provide an additional resource for students and colleagues who may be interested to pursue time more fully in shaping their design futures projects and pedagogies. The text indicates the richness and complexity of work on time and its potential to augment and activate design futures pedagogies and our students learning and projects and their anticipatory preparation for diverse careers.

In seeking to elaborate on these matters, we have worked with the following key problematics:

What is needed to support design educators, researchers, students, professionals and collaborators to understand actual and potential relations of time in shaping shared survivable futures?

How may time be conceptualised and understood philosophically, culturally and imaginatively and within and across domain specialisations to enrich a design view on futures and pedagogies?

What might a relational design framing of time in futures literacies be and become as a resource for further enriching design futures literacies?

How could we expand approaches and practices of design (futures) material to include time as a key and dynamic material in design futuring and its pedagogies?

When time is central to scenarios in futures and design learning and inquiry, how and where might we explore it roles more fully in realizing design future literacies?

What and why might a design temporal pedagogy be and what might it offer us in pursuing 21st century anticipatory design literacies?

Below, we offer a charting a diversity of takes on time as contributing to a view on anticipatory design pedagogies and literacies by way of the following interlinked sub-themes: 1) Orientations to time, 2) Relational views and 'design time', 3) Time as design futures material, 4) Time and design futures scenarios, and 5) Design, time and anticipatory pedagogy.

2.
Orientations to Time

BY Andrew Morrison & Corbin Raymond

Time as a rich 'resource'

Header

In the societal and personal uncertainty of a changing world, Facer and Smith (2021: 203) see universities as sites and catalysts for generative knowledge building and sharing in which 'time-knowledge'. In their view, this is a knowledge that demands deep reflexivity and attention to the politics of its translation into action via the interplay of praxis, following the philosopher Whitehead, but also by way of the interaction of knowledge and action (Facer & Smith, 2021: 207). They see this dynamic, as we too argue in a design knowledge perspective, as needing to be performed through the 'interplay between stewardship, experimentation, and imagination' (ibid.).

Design students and educators continually work with the interplay of shaping time-knowledge time in their classes, studios and projects. Design research, and especially for PhD students, is not only about managing time, but engaging with the temporal in research processes and modes of reflection and analysis. FUEL4DESGN, as a prospective endeavour and situational response to learning and teaching in times of crisis, has needed to engage with notions and conceptualisations of time in a futures view of design making and knowing. This has required we delve more deeply into making anticipatory meaning temporally. It entails the role of philosophical perspectives and world views in unpacking and positioning our understanding and engagement with chronologies, temporal im/materialities and verbal and multimodal, chronotopic design-centred mediations.

Thinking ahead with time as a design material, as it were, needs to be informed by ways the temporal and temporality are conceptualised. For many design students and educators it is challenging to take up philosophical texts: these are often deeply verbal and argumentative, and embeddedness in linked and differentiated arguments. Design practice, and its own conceptually rich character, may seem distant from such abstract thinking. Design publications on relations between design and philosophy (Willis, 2019) do exist (Marenko & van Allen, 2016) but may not be widely taken up by design teachers at master's level but be appropriate within select projects and PhD thesis work.

Design teachers and design researchers alike all work with time in their pedagogies, disciplinary or methodological. Yet, attention to time in design and design futures pedagogies is a more slippery pursuit if we sidestep looking more closely into the wider

knowledge domains and framings of the temporal. Our mapping of this below is partial, but we hope offers access to a diverse but related conceptual landscape.

In our own learning, designing, teaching and research we have come to see the temporal as central to developing an anticipatory design view that reaches beyond dominant notions and practice of time in making different, hopefully preferable and potentially better futures. For example, attention to world views and the temporal is needed when we ask students to engage with time in appraising the structuring force of the Three Horizons tool in our placing it within a design take on tools and strategic decision-making (see DESIGN FUTURES TOOLKIT). Our FUTURE PHILOSOPHICAL PILLS offers a diversity of routes to identifying and positioning how world views orient, frame and direct our perceptions and understanding, including the temporal (Figure X). Next, we offer a short summary of mostly key western philosophical orientations and concepts on time. Further explorations from the final year of FUEL4DESIGN and wider global perspectives are also presented in Volume 1: Otherwising Design Futures Learning.

Some core Western perspectives on time

The philosopher Bergson placed attention to the rhythmic nature of the temporal, but also its manifestation within abstracted notions and practices of time, as they have become mechanised and industrialised (Adam, 2008) and, most recently, globally institutionalised in a temporal mapping of our engagements online in Zoom and Teams. Duration or durée is one of the main notions of time framed by Bergson (1922). It refers to time that may be understood as an extent, a stretch or continual sweep, an endurance. Bergson also focused on time as being about multiplicities. This refers to time as a plural and multi-scaler phenomena and material. Time may be about an instant or point ('punctum') (Barthes, 1981), a space or an extent within which an event happens; it may also be about an immersion or a dwelling, a lingering, loitering or lying fallow even.

The pragmatist philosopher Whitehead (1925, 1929, 1938) added notions of time as being infused with impermanence, that is about being fleeting, immaterial, and essential unstable in its state. However, time may also be understood as being about flux. Whitehead further accentuated that the temporal may be fruitfully understood as about the emergent, processes and formations, that is matters of the processual or becoming. Building on Whitehead's positionality of the temporal as matters of becoming is what is taken up as the multiplicity of potentialities when referring to plurality. These potentialities are informed by how we frame temporality as constructivist, however, post-structuralist approaches tie these temporal potentialities to narratives, time and memory (Brockmeier, 1999: 22; Gergen, 2004: 2; Hasenfratz, 2003: 149) that disregard materiality, materialisation and embodied aspects of temporal and memory-related phenomena (Haraway, 2013; Latour, 2012: 42).

More recently Grosz (1999) addressed similar matters in anticipating 21st century contexts in which she pays attention to time as under-theorised. She accentuated time as a dynamic force, drawing on Bergson and Deleuze in examining processes of becoming in which the temporal is related to doing in the world and to 'knowing and doing otherwise' (see Volume 1: Otherwising Design Futures Learning). In later work,
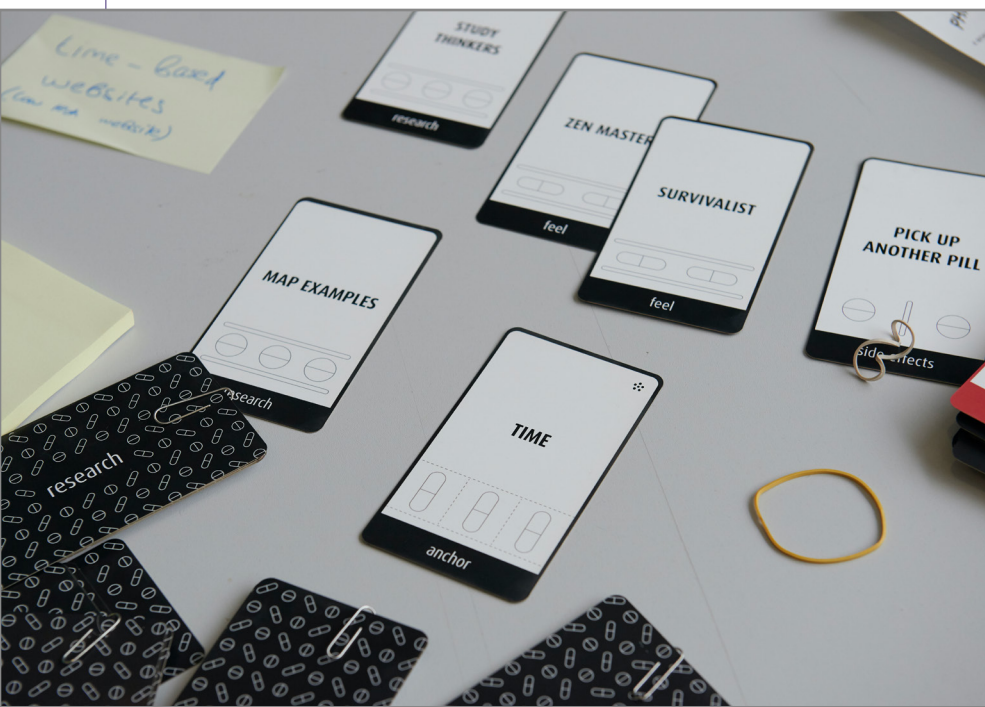
Grosz elaborated on feminist and embodied perspectives and understanding of time and relations to technology, evolution, culture, nature and power (Grosz, 2004, 2005). In discussing difference, thought and feminism in western philosophy, especially regarding Deleuze and Iragary, she argues that we need to develop familiarity with concepts and knowledges and realise hidden practice located concept relations that require their 'own time- the future of thought' to be actualised in practical philosophy (Grosz, 2005: Kindle). She sees time as being excessive, only approachable though its objects, subject and matter.

Grosz declares that her book *Time Travels*:

> *develops a concept of a temporality not under the domination or privilege of the present, that is, a temporality directed to a future that is unattainable and unknowable in the present, and overwrites and redirects the present in an indeterminacy that also inhabits and transforms our understanding of the privilege of the present. (Grosz, 2005: Kindle).*

Acknowledging pragmatist philosophers along with the value of working with differences, Grosz provides design pedagogy with a key perspective for working with futures. As the FUTURE PHILOSOPHICAL PILLS embodies in its flexible, combinatorial, activity-based design, students need to be able to work with the relations between ideas and concept finding and forming through practices and pragmatics moves and actions [Figure 1]. They may do this in the present but work too with interplays, syntheses and differences between different options, views and arrivals at informed, critical choices and rich, conceptual, critical, creative work of possibility and potential of their own.

This is a view Grosz (2004) argues for in her *In the Nick of Time*, in which 'The present itself, always a continuous present that never passes into the past, is nevertheless not

present to itself', so that we cannot work with design futures without looking at the coexistence of past and present and where the virtual only exists in time. Referring to feminist futures and political change, Grosz (2004: 255; original italics) argues that working with histories as volatile and with potential to be otherwise, '... is about the production of conceivable futures, the future understood not as that which is similarly contained in the present, but rather, as what diverges from the present, what produces a new future, one uncontained by and unpredicted from within the present.'

In developing a politics of time, we need to understand how the future ruptures the present, that is via events, as recent, ongoing and future climate and pandemic and consequences of challenges to food, health and geopolitical security attest. For Grosz (2004: 257-258):

> *The future erupts through a kind of leap or rupture—a phase transition, in the language of Prigogine, a moment of the eruption of the untimely or the nick—analogous to the leap into the past that constitutes memory proper. It is not the predictable, foreseeable continuation of the past. It is an unexpected shift, the shift produced by the unexpectedness of events, which reorients the past and whose reorientation or reanimation reorganizes its present effects without steps, in a continuity that is also a discontinuity, a becoming. This leap is politics as much as it characterizes life. Politics is not reducible to this leap, it is this leap: recognising itself in the past that prepares it, all politics, from the conservative to the radical, aims to develop a future through some efforts of the present.*

Student designers and design-researchers need to engage with the temporal as dynamic, not only sensory and to understand it as transitional, altered or unexpected. The temporal can be charted and marked but it may be unfolding in the processes of their projects, in and over time, and in how the temporal is embedded in their designs and what they offer users, or as systems. in working to conjure and situate their design work in their own present contexts, students make leaps beyond bounded moments and the immediacy of now. This may occur whether they are involved in reconfiguring historical antecedents or contemporary assumptions of how time is being taken up and communicated. It may also include a teasing out the temporalities and twists in developing speculative articulations just as it may be pertinent to explicit designs that allow participants to scale temporalities of access, purpose and use to their own temporal needs and interests, and along with them to the experience and effects of pace and rhythms of enactment.

Here, as the DESIGN FUTURES LEXICON indicates, concepts and terms are themselves part of such processes of knowing and becoming, linked with and shaping through practice our ongoing framings and positionings of design futures literacies and design contributions to shaping futures through critical practice and analysis. Attention to individual words is inadequate without means and placement of their wider discursive performative articulations and what they carry, propulsively. Key too is to be open to emerging and new terms and their descriptive and definitionally situated aspects. Equally, we need to work with temporal concepts, such as duration, and to

extend and apply it to design making processed and experiences and semantics of a methodological type.

In summary, as Grosz (2004: 258) mentions regarding feminism, design teachers and students need to learn how time works and may be put to work and included as material in negotiating the breach between the given, its disruption and dislocation in the present and its survival in the future. She wrote almost 20 years ago that, 'Only if the present presents itself as fractured, cracked by the interventions of the past and the promise of the future, can the new be invented, welcomed, and affirmed' (Grosz, 2004: 261).

In our current world, design pedagogy has been propelled into a massively contradictory-fractured present where the working of power, systems and policies have been exposed. We need to not only envision temporal futures as Grosz argues but to experiment with ways to make these visible, tangible and audible through and as designs in our teaching and learning and in the ways we relate to culture, technologies and nature.

These are complex challenges. They also ask that we pay closer attention to how temporality is framed and needs to be dissociated from the assumptions embedded in seemingly sensible or prevailing practices. We need to look to how they may lead us into new 'virtuals', ones that are also placed in an 'inventive capitalization' (Grosz 2017: 259). For Grosz (2017: 254):

> *These virtuals are the directions, the future, to and by which things and ideas bring themselves into existence and orient themselves. These are not futures we can discern in the present but futures that are virtual, among many possible paths of actualization to which the present may lead.*

Attention is needed in our design futures pedagogies to how philosophy and critical consideration of the working of world views can help us understand such future orientations. Paths to actualisation are also articulated, as voicing and connecting, via our vocabularies and the ways they bear and position values and intentional (illocutionary) and affective (perlocutionary) forces of becoming through acts and reflection on designing(see Volume 1: Otherwising Design Futures Learning).

Chronotopic thinking

Our contemporary understanding of time has been realised historically in a diversity of cultural expressions and practices, from early cave drawing of anticipatory hunts to markings of satiated events and completed actions. With regard to the 'modern novel', the temporal has been enacted and analysed as culturally framed and mediated (e.g. Genette, 1980; Ricoeur, 1984) and in the notion of the 'chronotope' from the narrative theorist Bakhtin (1981). The chronotope concerns how time and space are configured in language and discourse. Situating narrative as a cultural articulation of genre and the performative, Bahktin's dialogical view on communication, posed the fictive in literary

texts via imaginative mediation via time-space relations. Such a chronotopic view looked to narratives (as we do with design processes and experiences) as more than the sequential or diegetic event-based interplay of relations between writer-text-reader-society. Drawing on a frame of speech acts with situated activities of making and knowing, such a view locates the dialogical imagination as a socio-cultural construct and articulation that is itself a weave of performative activities.

However Bakhtin's explication of the chronotope was somewhat indirect in his writings in The Dialogical Imagination (Bemong & Borghart, 2000: 5). While its related concepts have been taken up in for examples studies of multimodal 'composition' (between media, design, technology and learning; Morrison, 2010), the chronotope has potential to be more fully activated in futures inquiries that are constructivist (e.g. Toumi, 2019). It is also applicable in an anticipatory design pedagogical framing with focus on the temporal, schemata and activity as unit of analysis where we engage with world-building, speculative design and suspensions of disbelief to rebirth creativity about the present, the future-in-the-present and the 'future-present' (see DESIGN FUTURES LEXICON).

Recently, Bakhthin's chronotope has been taken up in a paper on time-space perceptions and changes in representations of post-pandemic futures between the moment or 'kairos' and anticipatory futures (Grishakova, et al., 2022), with a focus on letters. These researchers conclude that 'Whereas the kairos moment becomes an incentive for imagining or modelling an anticipated future, chronotopic imagination molds the future into tangible shapes that reproduce, extend or transform current practices.' (Grishakova et al., 2022: 10).

In the past 30 years or so, we have witnessed the pervasive rise of digital technologies and globalisation, distributed communication and a mesh of multi-temporal delivery, access and uses of mediated processes and contexts of circulation, extending to locative and social media, services and performativities. Design has been central to all of these multi-level, multimediational dynamics. While attention to time has been prevalent in experiential and analytical approaches to such developments, such as in the early ground-breaking work of Adam (1990) and in the humanities, social sciences and technology studies, connections between design, time and futures have not received similar weighting, in contrast, for example, to focus on participation. This may be in part due to the fact that design is always concerned with that which is not-yet or is about-to-be or that which might become. In pursuing a pedagogy of futures in design learning, design located chronotopic thinking and activity remains to be elaborated and included in emerging and experimental discourses and practices via anticipatory literacies.

Time has already been addressed critically in relation to modernist notions of progress, temporal management and tools, and the exponential speed of delivery and data processing in 'digital capitalism' that Wajcman (2015) conceptualises as a matter of being 'pressed for time' in its construction, management, tools and practices and the power we delegate to them. Strzelecka (2021) talks about the paradoxes of neoliberal approaches to time as remembering to remember, planning to plan, and accelerating acceleration. In such processes media and technologies are seen as serving to 'synchronise the social' (Jordheim & Ytreberg, 2021).

Temporality, socio-technical change and ecological design

The interplay of media, data, and temporalities more specifically is summarised by Lohmeier et al. (2020: 1521-1522) as follows: 1) 'time as an abstract category requires mediation in order to be experienced'; 2) 'our media experiences are fundamentally about time', and 3) 'time and temporal experiences become part of the business model of media technologies'. These are all

complex aspects of how time is constructed and operates and they place considerable demands on us as design students and teachers who are embedded one way or another in working with time as a design material (see below). Hoffman (2011: Kindle) sees our cultural attitudes towards time as being characterised by what might be called temporal omnipotence. For her, 'Temporal omnipotence is the most omnipotent form of omnipotence, for it tries to defy the inexorable and the inevitable.'

While the changing carnage of climate change might seem unstoppable, for design students a primary ongoing future challenge is how to work together with modes of mitigation and alternatives to inherited ecological environmental systems and infrastructuring. Mediated socio-technical change is now linked with ecological and environmental specialisations through collaboration with scientists, urbanists and landscape specialists, amongst others. Time as design material, as we discuss shortly, is also now well worn into our mediated work and lives: it is a further contributor to and participant - from local to planetary levels - in complex systemic and communicative configurations of human and non-human relations, from the biological to the technological and ecological.

Time, design and digital technologies

Digital technologies all too often embed us in a linear notion of work and work ethics. Yet, the same technologies are connected with globalisation and the construction of multi-temporal schematics in which we experience a surfeit of information, streams and interruptions of social and online media context. This is increasingly so where affluent societies are infused with mobile, digital tools and services that support but challenge our embodied, physical experiences and environments.Design teachers and students are inescapably embedded in these dynamics and need to understand their own personal points of view (see DESIGN FUTURES SCOUTING) and the ways in which these are realised via assumed, embedded, promoted and chosen world views and socio-technical philosophies (see FUTURE PHILOSOPHICAL PILLS). It is also therefore important that we develop critical vocabularies of time (see DESIGN FUTURES LEXICON) that are not simply chronotopic signifiers but are understood for the dynamics with which they are selected and that are put to use as conceptual and cultural resources in shaping design futures literacies.

Time and space relations are central here. Our experience and uses of time are embedded in designed systems and services that are not linear: they work through complex activities of interplays of the spatio-temporal. Further still, they themselves constitute new formations and artifacts, along with matters of dislocation and re-

distribution. Time as a resource, and time as a non-linear capacity, are dependent on access to technologies and to systems of their co-construction. Speed, presence, processing and revisitation are not equally distributed, whether societally or within design schools across the globe.

In all of these dynamics, it is often challenging to work within and with time. There are also challenges to how we are able to focus our attention on the demands of multi-temporal systems and uses, extending to our own designing. The rapidity and durability of digital technologies and enactments are also paradoxically difficult to process because of the ways in which they may demand instantaneous attention. This is challenging for us when we are motivated by logics of accumulation, growth, profit and consumption logics embedded in their designs and purposes

and their mediated performativities (Demos, 2020). In an even more entangling move, the design, delivery and 'directives' of these tools and platforms and our embedded and embodied uses of them together are also being constantly being constituted - and erased and replaced. This is achieved technologically, as much as culturally, by way of software and algorithmic patterns and through our constructed and felt desires and embodied behaviours that are also bio-psychologically fuelled.

Issues of time, design and specialisation

Today, however, this is not merely a matter of working with the artificial and what 'ought to be' (Simon, 1988) as focus on the immediate, mediated, managerial means of temporal marshalling massively obscures problematic relations to living and working with time. Design futures literacies entangle us all with the expansion, specialisation and emergent transdisciplinarity of Design and a plurality of relations and domains.

Development in Computer Science led to specialisations such as Human Computer Interaction (HCI) and a specific focus for design schools on design views on interaction, ranging from digital im/materiality to current user based performativity of social media, the Internet of Things (IOT) and data-driven approaches to the design of Artificial Inteligence (A.I.) and massive data and its distributive agency in contexts of purposive, and situated uses. Time has featured in interaction design and has been characterised over the past 30 years as being patterned on two dimensions of what and how it has been studied (Wiberg & Stolterman, 2021).

The mapping of this research reveals a turn to temporality in as design material in HCI with focus on methods for temporality and theoretical conceptualisation of the temporal. Wiberg and Stolterman (2021: 264) explain that:

> *… we have structured our analysis around the HCIoT model (Human-Computer Interaction over Time), and accordingly, we have focused on HUMANS - on the pace and rhythms of work and life, COMPUTERS - fundamental principles for computing and visualizations, INTERACTION - temporal explorations of interaction and TIME - phases in time and historical perspectives on time and HCI.*

Attention is being reclaimed for a design disciplinary knowing (Edeholt & Joseph, 2021) but also for the undoing of design's disciplinary silos and claims to be a science rather than an alternative to binary knowledge categories and framings. Time needs to be addressed within and across and between these positions and perspectives.

Design futures and polycultural temporalities

In how we frame, conceptualise and critique content approaches to time in our education and shared futures through design, we need to acknowledge that time is a shared concern and in need of local and global attention. Time is thus also locative. It connects to proximity and place, to distance and position. Yet, we importantly need to face up to the future as located in culture. 'The future is a cultural fact' (Appadurai, 2013). In exploring cultural design futures temporalities, we need to acknowledge that time is not equally distributed as a socio-cultural resource, neither is it available and accessible as a citizen commodity. Nor is it similarly located culturally (Sharma, 2014) or conceptualised alike as a distributed artifact or spatial resource.

In the changing and urgent contexts of climate disasters, ongoing carbon increases, desertification, ice melts and warming oceans, amongst others, design as a multi-discipline and polymorphous pragmatic practice needs to engage far more closely and critically with the interplays between design futures and cultural temporalities as we experience the effects of environmental change and our human and planetary existence under duress. Time is in our view an under-acknowledged design rich material for working with ways to shape long-term survivable futures. However, it also needs to be understood not as mechanistic clockwork bureaucratic notions and steerage of time but also as a plural, cultural material for further investigation.

Where design, as with for example Anthropology (e.g. Bryant & Knight, 2019), has begun to address matters of decolonising its pedagogies and discourses (refs), acknowledging plurality (Escobar, 2017) and design's global-local relationality, time and design are also in need of recognition of multi-temporality as being culturally constituted and articulated. For, as (Sharma, 2022: 46) observes:

> *Placing others in and out of time is an endemic and common form of social control for the sake of maintaining a white, capitalist, patriarchal, and colonial temporal order. Treating time as addenda to people, objects, media forms, or historical periods will leave unchallenged the deeper complexity of the reigning temporal orders.*

Temporal orders are complex for design students to negotiate in studios and fieldwork in which diverse perspectives on time may not be explicitly discussed or acknowledged. However, many master's level courses and PhD schools and groups are composed of students from many different countries and thereby different cultural practices and conceptions of time.

However, time still needs to be decolonised with and by our students when they work with temporality and where stakeholders, planetary need and changing timescapes of

designing challenge reigning temporal orders, as Sharma identifies. We cannot assume that this will simply happen and that temporal experientiality will be evident, or emerge, be articulated or listened to when western notions and practices of time, and especially their embeddedness in market-centric design temporality, prevail and operate as defaults. We need to enrich our curricular cultural temporalities if we are to more fully understand relations of alliances and affinity rather than separation and telemetry.

Plural notions and lived experiences and cultural resources of time, and their locations and practices in Indigenous societies and world views have also prevailed in the face of reigning temporal orders. Both fragile and assertive, Indigenous notions and practices of time are taken up in narrative accounts in a collection addressing matters in central and South America (López-López & Coello, 2021). West-Pavlor (2013) points to such perspectives as multiplanar, amongst other features of Aboriginal Australian peoples' temporalities. Akin to such perspectives, Māori philosophy reminds us, for example, that time and space are unified not separate and that knowledge resides with co-present ancestors, in and as place and through dreams and intuition (Tuari Stewart, 2021: 12, original italics). The postcolonial, Mbembe (2001: 14) reminds us, whom West-Pavlor cites, made of a multiplicity of times, as duration, that is 'made up of discontinuities, reversals, inertias, and swings that overlay one another, interpenetrate one another, and envelope one another: an entanglement'.

Opportunities exist for exploring not just time machines and time travel, alluring as these are conceptually and in popular cultural media, but world views in which time is already chronemically understood and is part of living activities of sense making. It already reveals alternative deep presents that may help us work further in understanding the temporal in shaping our design futures literacies.

Time itself will need to be protected and given to make it possible to listen to ways the temporal is understood and experienced, to ways it may allow us to rethink some of the fundamental assumptions of living and working as designers in the Anthropocene. We will need to further re-examine relations between time and ethnography and Anthropology (Marcus, 2016) and notions of 'time and the other' (Otto, 2016) concerning reading, shaping and sharing multiple timescapes in ongoing agentive experimentation in what Holmes and Corbe (2022) address in their collection entitled *Critical Intercultural Pedagogy for Difficult Times: Conflict, crisis, and creativity*.

There are many items listed here that are not central to the approaches to the temporal in our design curricula, in our own Europe-based project and wider afield; they offer us additional experiences and resources to work with the entanglement of diverse views on the progression, recursivity, spatiality and dynamics of time in shaping design learning in and for unfolding futures. These are futures that unfold in the present, and will need to be anticipated, directly and indirectly and we can only but tangle with difficulty and complexity in framing whose futures, when they matter, how they are addressed and survived. As Yussof (2018) argues, it is time to acknowledge deep time. The Anthropocene has introduced an epochal conceptualisation of 'deep time' into our geological but also social psychological lived realities of the present, whether atopian, utopian or dystopian.

The futures we pursue and design towards and beyond need to be more than a transactional, bureaucratic resource for near future productivity only at the cost of deep temporal survival. Instead, our design schools ought to be - if any one has the luxury and even duty of learning about making futures – active and experimental, even quirky and testy, beacons for shaping room and ingenuity to bring design imaginaries and our best pragmatic solutions into nearby futures and, where possible, through backcasting futures in and through design to more immediate present needs (see also Joseph, 2019; **Essay 3: Sustainability, Systems & Learning Design Futures**).

At fo.am, a transdisciplinary network that 'grows worlds' (**Link ↗**), Kuzmanovic and Gafney (2017) have explored what they call pre-hearsals and pre-enactments to extrapolate rich possible different presents and their anticipatory models:

> *In a prehearsal the model of a possible future can be inhabited, explored and shaped, through observation and improvised engagement. In prehearsals the model becomes internalised, then dissolved and challenged through actions, reactions and interactions. As in play and games, improvisation becomes a tool for both getting to know the world and shaping it. Knowing that the prehearsal is essentially an embodied model, the participants can use their capacity for anticipation and speculation to stretch what is present to what might be possible.*

In working with transcience and a liminal state-space in effecting organisational change, Kuzmanovic and Gaffney (2017) have found that we dissolve not solve our responses to working with anticipatory experimentation as means to find alternate pathways to framing agency and intent and then attunement. In these processes we need to engage with temporal shifts and phase change expectations:

> *So when 'what if?' questions manifest in immersive 'as if' situations, all our senses are engaged and the experience can become an animating force. A speculative experience can animate us in the moment, but more importantly the visceral memory of an experience can re-animate a sense of agency and possibility long after the actual experience is over.*

Here the accretion of experiential time also needs to be acknowledged they argue. They write that 'Change is a constant, shapeshifting presence. It can be an opening to explore different dimensions of the possible. A way to move towards a more heterogeneous, compassionate and imaginative culture.' Working with, in, through and in multiple timescales is a challenging addition to our given notions and practices of visual, verbal, haptic, kinetic, proxemic and spatial literacies. It becomes the more interesting and entangled when we situate temporal design literacies in the wider context of Anthropocenic contexts and discourses, design improvisations and experimentations in which posthumanist perspectives are also acknowledged.

Anthropocenic, posthumanist design temporalities

Ours then is a time that asks design professional domains and design universities, educators and students to rethink how we understand time, and how we might go

about working with it in shaping futures today. These futures-in-the-now are acute. They need urgent action within the present for design to be effected differently in the acute context of climate change. Strategic design has suddenly become a matter for all of us, even though it may not be explicitly named in our various courses. Persuasion, engagement, and values are also heightened aspects for critical discussion and in the longer view in reshaping design premises and practices. This is more complex and more demanding because it means we have to also look outside design to understand phenomena and expertise so as to work collaboratively with others in tackling what and how to actualise futures in design that is importantly to be built through designing.

Designers must and will need to continue to work under a form of temporal duress: they will need to work with and in time for distant trajectories right now, with decisions made this very decade having long-term repercussions for personal, species and planetary survival [→ SEE FEATURE 2.] This view is often repeated in each essay not to make ideological chimes for change but to repeatedly state, remind, promote, urge and also insist that design education cannot avoid working with deep time and deep change. For Farrier (2019: 6) the:

> *Anthropocene describes how humanity has radically intruded in deep time, the vast time scales that shape the Earth system and all the life-forms that it supports. Deep time has become both an astonishing and disorienting—and a familiar—element in the everyday. Our dependence on fossil fuels, rare earth minerals, and plastics puts us in intimate contact with far-distant pasts; the prehuman Earth shapes the present not just in terms of geological strata and evolutionary biodiversity but in terms of the textures, devices, and processes that articulate our experience of modernity. But the various ruptures that these dependencies have created—such as changes in atmospheric, soil, and oceanic chemistry and the depletion of biodiversity—also highlight our intimate relationship with the very deep future.*

Ruptures. Our intimate relationship with the very deep future. What are to we make of these brutal and fundamental forces and effects? How are we to make futures frames and means within a design educational ethos and practice?

Needed is profound rethinking of the temporal in design for alternative modes of working, making and consuming. This is a rethinking that needs to draw productively on the diversity of experience and expertise of our design educators and researchers and our many knowledge networks and activities. These changes cannot but be located in fundamental visions, choices, policies and practices for sustaining reduction in carbon emissions and delinking from fossil fuel-based energy suppliers and systems and their vested interests in profit ahead of planetary needs and sustainable systems design and implementation. As Irvine (2014) argues, we need to acknowledge that deep time is an anthropological, human problem. This points to its being realised through our human perceptions and actions and that these too are socially and culturally constructed, emergent in their being situated in their own becoming and cast within historical and assumed values in need of reappraisal and, for design, professional and pedagogical reconfigurations [→ SEE FEATURE 3].

Hypothetical Authorities

STUDENT: Krzysztof Wronski

COURSE: MDEF 2020-2021, ELISAVA & IAAC

BY Oscar Tomico, Guim Espelt Estopà, Jana Tothill, Roger Guilemany & Mariana Quintero

Krzysztof Wronski used the opportunity of the master's course relating to Scouting to continue investigating his interest in shaping and maintaining what he called 'Hypothetical Authorities' with a project that seeks to reframe our relationship with authorities, who shapes them, and the types of challenges they focus on from a design perspective. Using the Atlas of Weak Signals, Wronski identified himself with the thematic group of 'After the Nation-State' as a compelling starting point and, in particular, 'Pick your own passport' and 'Making world governance' weak signals. He soon realised the possibilities this tool gave him for unpacking complexity by showing different angles and approaches to take into the subject matter. Wronski's probing nature, exploring opportunities as they arose, allowed him to test different means, methodologies and alternative presents within the same area of interest.

Wronski developed a total of six interventions during the master, leading to a final intervention and a speculative artefact embodying his alternative present. His first three —'Clickable prototype', 'Authority proposal' and 'ChatBot'— remained human centric and tackled border policy and concerns, while his following interventions —'Ecological listening unit' and 'Autonomous tree'— started taking a more post-human approach giving centre stage to other species.

For his first intervention he decided to use role-play activities and expose people to the border control role and see if it led to any realisations or insights about behavioural patterns (Figure 1).

Contrary to the fixed approach used in the first intervention, his second intervention opted for an open-ended conversation where participants would propose 'new authorities' to explore immigration rules between Turkey and Bulgaria (Figure 2). At this point, he started considering the concept of authorities as a space for art installations in the form of research through design and explorations. He began

reimagining authorities, by considering the most significant challenges of our time and how authorities (or a lack of them) could prepare us for massive change in areas like mass migration, wealth inequality, and the climate emergency.

The 'ChatBot' intervention (Figure 3), aimed to propose an alternative future where one could easily interact with a digital agent to share their voice in a political process. From the responses Wronski identified 5 recurring themes: Ecology, Governance, Inequality, Knowledge, and Community.

It was Wronski's interest in post-human design that made him increasingly blur the boundaries of the human and non-human, this led him to his fourth intervention. With 'Ecological listening unit' he was attempting to provide an equal amount of attention to a tree in Barcelona as to his human counterparts, reflecting on the tree's needs and challenges (Figure 4).

For his fifth intervention, Wronski planned and organised three conversational co-creation and knowledge-sharing gatherings for his 'Authority Jam sessions' (Figure 5).

His final intervention in his future scouting process was an art installation he named 'The autonomous tree'. He equipped a tree with similar equipment and sensing technology an autonomous vehicle has, to transform it to hypothetically act and represent non-human living beings within established human systems of governance and discourse (Figure 6).

'Autonomous Tree' keeps creating discussion-provoking conversations of new alternative presents, where humans are subjected to a non-human authority that has been around for longer than us, when it comes to ecological decision-making policies.

Wronski's probing nature (Figure 7) allowed him to develop his future scouting process, by testing out different scenarios for his proposed alternative presents. Throughout his interventions Wronski studied and questioned alternative ways of seeing the concept of 'authority'.
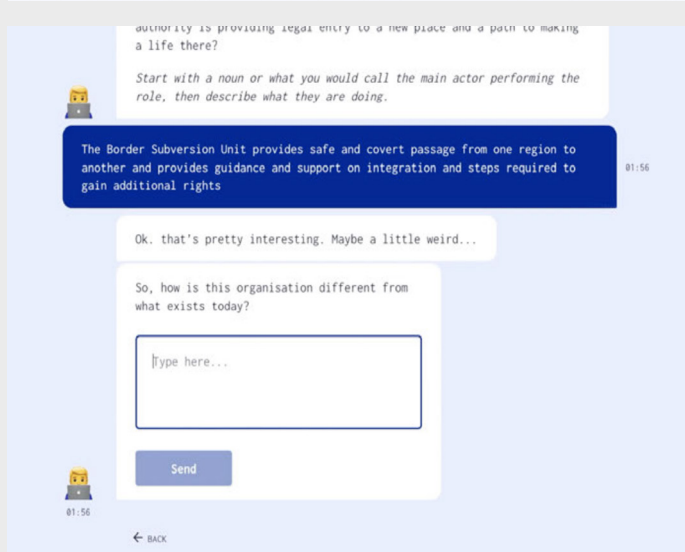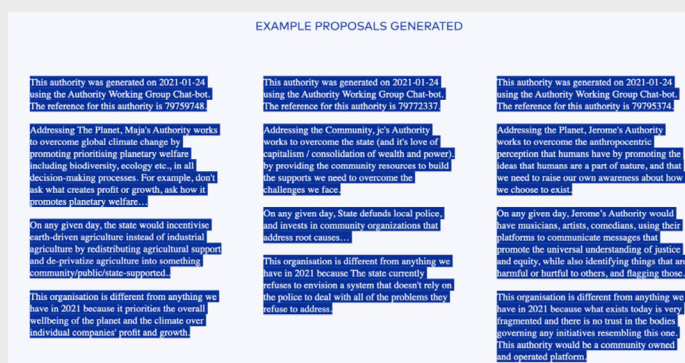
▲ Figure 1: Krzysztof Wronski's 'Clickable prototype' intervention (top), ELISAVA & IAAC.

▲ Figure 2: Krzysztof Wronski's 'Authority proposal' intervention (middle), ELISAVA & IAAC.

▲ Figure 3: Krzysztof Wronski's 'ChatBot' intervention (bottom), ELISAVA & IAAC.

▼ Figure 6: Krzysztof Wronski's' Autonomous tree' intervention. Master's in Design for Emergent Futures (ELISAVA, IAAC).

▲ Figure 4: 'Figure 4. Krzysztof Wronski's 'Ecological listening unit' intervention. Master's in Design for Emergent Futures (ELISAVA, IAAC).

▼ Figure 5: Krzysztof Wronski's 'Authority Jam sessions' intervention. Master's in Design for Emergent Futures (ELISAVA, IAAC).
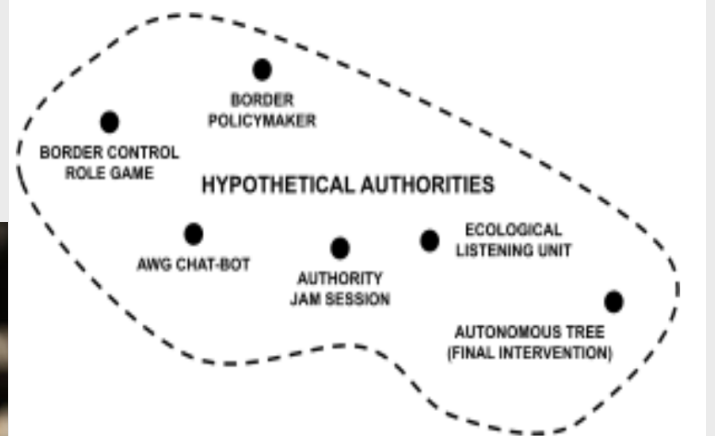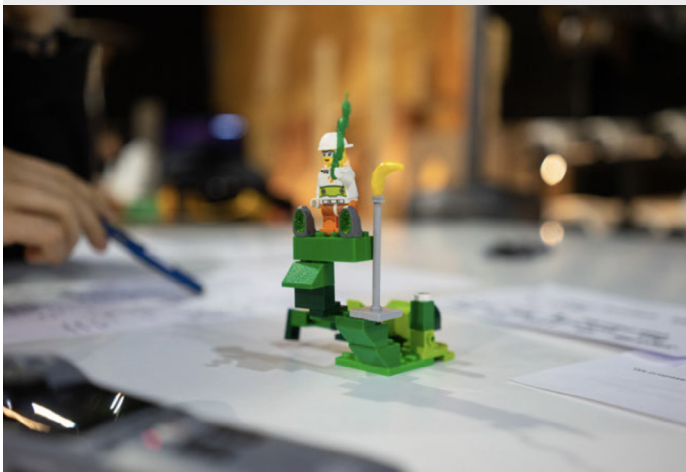
▲ Figure 7: Krzysztof Wronski's probing drifting in futures scouting representation. Master's in Design for Emergent Futures (ELISAVA, IAAC).
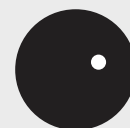
PoliMi PhD School

GROUP: 7

YEAR: 2022

TEACHER: Manuela Celi

STUDENTS: Helen Berhanu Tekle, Filippo Bugni, Matteo Corradini, Sabrina Gadotti, Elena Scarpelli, Zixin Zheng

TAGS: Time. Control. Power. Productivity.

BOW

The intertwining of humans and devices has influenced the sense of the passing of time since humans have been submitted to their own perception of it for so long. Another effect is the suppressing of fundamental needs like sleeping or eating, in exchange of being more productive in achieving their working goals. BOW ensures that the worker is forced into adopting a more contracted posture, fostering the control of the brain into activities while diminishing other needs and influencing the perception of time.

Questions that have arisen take the form of the following:

To which tools and methods might we turn?

Where is our best practice?

Which design schools are inspirational and at the forefront of working with futures?

Why is it that design education is so seldom a key part of our research profiles and so often overwhelmed by the minutiae of daily operations?

What drives resistance to engaging in concert with the deep demands of our changing societal and environmental world?

Do we even discuss the ethics of time and of our times and what we might have done while we teach scenarios and principles of recycling and re-use?

As departments and institutes, do we engage in content-driven education of our own to work together to be well informed about major changes in thinking and application beyond design?

How do we discuss and strategise the interplay of pedagogy and research to enrich our climate justice and design environmental pedagogies?

What are the perceptions and vies of our students on climate change, design learning and challenges of needing to face complex temporalities in learning for future professional action?

Many colleagues will have answers to many of these issues, though we wonder to what extent these views and already engaged activities are connected and co-ordinated. Design schools are a key site of critical creativity for allowing space to learn and to try out alternate futures, differences in their options and, above all, power in working with possibilities that may inform and even motivate us to propel ourselves into future design professional work and change. Some impulses can be found in the Environmental Humanities where attention is given to narratives and creative scenarios (e.g. Schaberg, 2020) and to examining diverse cosmologies of the Anthropocene (Vetelsen, 2019).

In their multiple-discipline *Manifesto for Living in the Anthropocene*, Gibson, et al. (2015: i) point to the need to work experimentally, both expansively and creatively, in how we listen to the world and develop a reparative (not only critical) view on what they term the tragedy of climate change. They note that 'While connection to earth others might be an overarching goal, it will be to certain ecologies, species, atmospheres and materialities that we actually connect' (Gibson et al., 2015: vii). In the past decade, posthuman perspectives have filtered into design inquiry (e.g. Forlano, 2018) and to perhaps a lesser extent its pedagogies. In essence, these views acknowledge a nonbinary logics of actors and agency that does not separate human and non-human in wider ecological framings of living systems. Drawing on earlier work by Foucault and Chakrabatry, in *Anthropocene Feminism*, a variegated collection of views is offered that counter techno-determinist, geoengineering and earlier biopolitics (Grusin, 2017).

Rethinking living futures beyond market logics

These works present what are complex issues and perspectives for students and teachers of design to locate, examine and apply. However, they are central in developing design that is informed by acutely argued critiques of 'business as usual' and where vested interests need to be unmasked in terms of their pervasive arguments, structures and discourses. Design teachers will need to read more and selectively too; design teachers will need to continue to work with and to expand on a diversity of partners in alliances and specialisations to draw together readings and to develop ongoing critically positioned design oriented responses to research, to a range of publication and information types and re/sources. Here, as mentioned in other places in this book, design students will need to be prepared not to take what is marketed to them at face value [→ SEE **FEATURE 3**] so as to be able to enter work in marketplaces that will equally need to be reconfigured to meet the complex, changing and already violently manifested and experienced effects of climate change in the wider complexity of working and learning through designing in the Anthropocene.

This is a matter of a strengthening 'a pedagogy of becoming' in an epoch that is making itself brutally felt to us mortals, through fires, floods and droughts, challenging our mortality, morality and our sense of 'mastery' as forces of nature parch and wash away our previously seemingly powerful anthropocentricism. Yet, our 'design pedagogies of becoming in the Anthropocene' will demand that we rethink our anthropocentricism, not just in recognising deep time, non-human entities and complex ecological systems and processes and coloniality (Wikberg, 2020). These are pedagogies that must find ways to creatively and critically re-jig our own responses, actions and accountability to other persons and societies and entities and ecologies [Figure 2].

In this regard, climate change does not recognise national frontiers, nor can just one nation's valorous attempts to reduce carbon footprints alone mitigate the ongoing destructive forces of others. Our design schools and the worlds into which our graduates enter and engage will require them to identify not just contradictory and consensual views on complex matters, but to negotiate how time is understood, worked with as material and to insist on ethical temporal practices that indeed work to cancel out short-term, profit-driven policies and practices and to develop alternative understanding of timescales through active designing.

In doing this, as Wiggin et al. (2020) argue from an Environmental Humanities view, we will need to 'think across ecological temporalities' and we will need to turn this thinking into designs around the notion of timescales. Fornoff et al. (2020: xiii) write that 'We envision a timescale not as a smooth slice of neatly separated layers of time but rather as composed of jostling of unstable temporalities, defined by processes of assembling and unravelling, ruptures and contingency.' However, this too must not become a linear process from proposition to design, but also exists as a dynamic interplay of a temporal pedagogical unfolding of its own. Further, this unfolding needs to actively seek to decolonise time relations in design world views. It needs to expose its masked frames and evident consequences resulting from a normative linear chrono-politics and instead be materialised in a differently practised design education for far-reaching,

AREA OF INTERVENTION

Mapping of the elements that contribute to the intervention

Fighting AI
Bias

Human-Machine Creative
Collaboration

Stefania
Druga

Atlas of weak [1]
signals

Cognimates

MIT

Machine
Learning for
Kids

State of [2]
the art

Tech for Equality

Hackidemia

Future Learning
Unit

Education (AI
Literacy)

Elements
of AI

Fab Lab
Barcelona

'Democratic AI'

Co-Design

Development [3]
& Testing

Collegi Sant
Andreu

The Puerta
Project

Workshops

Scratch

Introduction
Teacher Guide
Lesson Plan
Student Guide
Extra Activity
Evaluation

'Package'

Tools & [4]
Methods

Raspberry Pi

Projection [5]

Wekinator

AI Curriculum

Data Scraping

New Scratch
Plugin

Future of
Education

Key Word
Analysis

Word Clouds

Speculation [6]

1 - Locating The Puerta Project to
identified weak signals

2 - Projects and research groups that
have inspired and aided the
development of The Puerta Project

3 - The context for developing The
Puerta Project

4 - Techniques and tools being used in
project development

5 - Projecting outcomes and of project
direction

6 - Mapping weak signals on a timeline,
exploring impact in the year 2050

2019	2030	2040	2050
	Tech for Equality		
Fighting AI Bias			
	Human-Machine Creative Collaboration		
Education - AI Literacy			

How will a 13 year old learning about AI today benefit in the year 2050?

The Puerta
Project

https://mdef.gitlab.io/oliver.juggins/
oliver.juggins@iaac.net

◄ **Figure 2**
How will a
13-year-old
learning about
AI today benefit
in the year
2050? The
Puerta Project,
ELISAVA. Shown
is a visual
representation
of the design
space from
Oliver Juggins,
including weak
signals such as
human-machine
creative
collaborations,
new jobs,
fighting AI
bias, tech
for equality,
fighting
Anthropocene
conflicts,
and related
keywords.
Master's in
Design for
Emergent
Futures (ELISAVA,
IAAC).
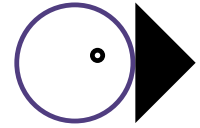
long-term change. To act in opposition to this is to commit to a design temporal pedagogy that is little short of design delusion while time for action and in many respects is simply running out.

This is no longer a matter of human control over contexts, materials and resources, but a planetary challenge for us to reposition our understanding and practices within changing planetary processes. We are confronted here by our own assumed design literacies in earlier frames of functional, 'mastery' and extractivist logics that by their nature and exercise have contributed sorely to the temporal crisis in which our design pedagogies now need to reassess and reconfigure. We cannot tackle this. Yet we will need to learn how to trans through understanding of deep time and systemic environmental forces and flows beyond our human control, while a consequence of our very human will to dominate, plan, control and consume.
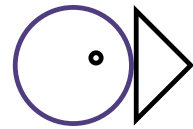
3.
Relational Views and Temporal Design

BY Andrew Morrison

Relational views and 'design time'

From vignettes to systems views

In working with concepts and practices of time in design futures education, finding and making relations between difference, contiguity, continuity and change is no small feat. Added to this mix is that with the global reach of digital culture, migration and contact, increases in international student places and plural experience in the student body and staffing in western design schools (within which FUEL4DESIGN was located), conceptualisations of time are in effect culturally diverse. This poses interesting challenges and opportunities for us all, as we elaborate further in the final chapter in Volume 1 entitled Otherwising Design Futures Learning.

Working relationally in education has been addressed by Edwards (2017a, 2017b). Key concepts include relational expertise, the importance of common knowledge and relational agency. The latter we take up in Essay 5: Care, Engagement & Design Futures Knowing. For Edwards what is significant is that relational educational work takes place in and across practices. In design educational terms, the poetic and ethnographically enacted and voiced work of Diatta et al. (2022) offers us a recent take on shaping a relational design practice that is material and embodied. They write that.

> *A relational sensibility asks us to attend to our relationship with ourselves and the people around us. The multiple reasons we intersect over a project are matched by the divergent ways we negotiate the inter and intrapersonal complexities of working with people. For all the planning and development that goes into forging co-creative spaces there is limited space given to expansive conversations that allow our individual sensibilities to show up in full.*

> *… Small vignettes of practice invite an exploration of ways for moving across/through/ to/between the larger questions of how a critical relational design practice might be deepened. … For every day each of us works in relation with people and in relation to large social systems. Therefore, every day we need to fight for, contemplate, forge, spark, define new ways to be, to act, to sit, to resist, to make.*

> *However, such focus on relational design also needs to more extensively include temporality in its systemic views and in its palette of materials. Temporal design has received some attention in recent years and again indicates that design may benefit from closer connections with similar pursuits in art and art education.*

In a curated session at the 3rd International Conference on Anticipation held in Oslo, Norway in 2019, shortly after FUEL4DESIGN began, a team of teacher-researchers from Oslo and CPUT in Cape Town presented and discussed relationships between relational ontologies and 'futurescaping' in design projects and education (Raymond et al. 2019). Such views are also taken up more fully in Volume 1 in the chapter entitled Design Education Reconsidered (see also Strang, 2015; Lima, 2021).

Temporal design

Temporal design (Pschetz et al., 2016) has been conceptualised as a pluralist perspective to challenge dominant conceptions of time rethink ways designers may work with time as heterogeneous and entangled with social formations, especially when it is taken up as socially coordinated and allowing 'more inclusive temporal institutions to emerge' (Pschetz et al., 2016: 2110).

In 'Temporal design: Rethinking time in design', Pschetz and Bastian (2018) argue for a shift from perceptual views of time concerned with pace, direction and subjective experience to a more pluralist relational view. This includes the cultural, social and economic in a view that seeks to be more inclusive and political in perspectives that may be included in our understanding of time.

Pschetz and Bastian (2018: 174) argue that design possibilities have been limited by dominant narratives of time (flattened rhythms and expressions, that dominant narratives of time have limited design possibilities, dichotomies of fast and slow, uniform present and linear progression, locating temporality within artefacts and systems, promoting hierarchies of time). In contrast, they offer a view of 'temporal design' in which:

> *Design futures needs to understand time as non-linear, as recursive, infused with leaps and returns that may be in contrast to the metrics of contemporary managerialist bureaucracies, needing periods of intense work and needed fallow, of pause and reconfiguration, or accelerated crisis management and a gentle lean into the unknown as it twists and turns, jolts and arrests, dips and soars. In these chronotopic design landscapes short-term expediencies in market-driven design undermines the long-term sustainable and deeper change for a flourishing and ecologically fruitful planet. (Pschetz & Bastian, 2018: 174).*

Our anticipatory design-*ing*, following Lury (2018), as process and action (Brassett & Marenko, 2015; Marenko & van Allen, 2016; Lury et al., 2018), then, is very much about the extent and reach into what sorts of futures and by and for whom but also their influence and impact back into the present. We see that this raises a need to explore the dynamics of engagement by and between a diversity of teachers and students and stakeholders to design processes in an anticipatory design frame [→ SEE **FEATURE 4**].

In design futures education, distinctions and connections between disciplines, methods and practices need to be teased out by working with temporal materials and

Design Future Scenarios - Playing with time

BY Corbin Raymond

PHD WORKING TITLE: Go with the Flow

SUPERVISORS: Andrew Morrison (AHO, Norway) & Elmarie Costandius (University of Stellenbosch, South Africa)

The notion of time is commonly understood as a quantitative unit of measure when applied to observed repetition, temporal intervals and cycles, such as seasons, lunar cycles, the earth's rotation on its own axis, as well as around the sun (Denbigh, 2012: 24). These equate to units of measure such as minutes, days, months and years. The shift from the cyclical to linear progression as measurements of time is taken up in general physics in the equation $t=d/s$, whereas in astrophysics the astronomical measurements of time is the observed distance light travels at a given speed, commonly referred to as light years (Denbigh, 1981: 40).

However, when the concept of temporality and time is taken up in Futures discourse, temporal indicators, signals, categories and segmentations are brought forward as Past, Present and Future. When we design with time as material, a distinction needs to be made between time as units of measure and time as temporal indicators of past, present and future (Flaherty 2002: 149).

Designers take up the concern to design amidst the increase of atmospheric temperature, largely due to the increase in carbon emissions, which correlates to anthropogenic climate change (Joe, Tyszczuk & Butler, 2014: 12). From this perspective, contemporary views on sustainability are entangled with time, and more so, with the future. Designing for sustainability as a disciplinary design practice therefore is a temporal futures positioning within the now.

To clarify, when we design with time as material, we take on a relational ontology between temporal indicators as a way of positioning our futures approaches (Hodges, 2008: 410). From this positioning, we enact, perform, anticipate, animate, demonstrate and experience temporal indicators over time (Raymond, Morrison & Mainsah, 2022: 5). Which means, we can design with the future, the past and the present, today.

This essay on designing with time will show and reflect on an ongoing PhD research
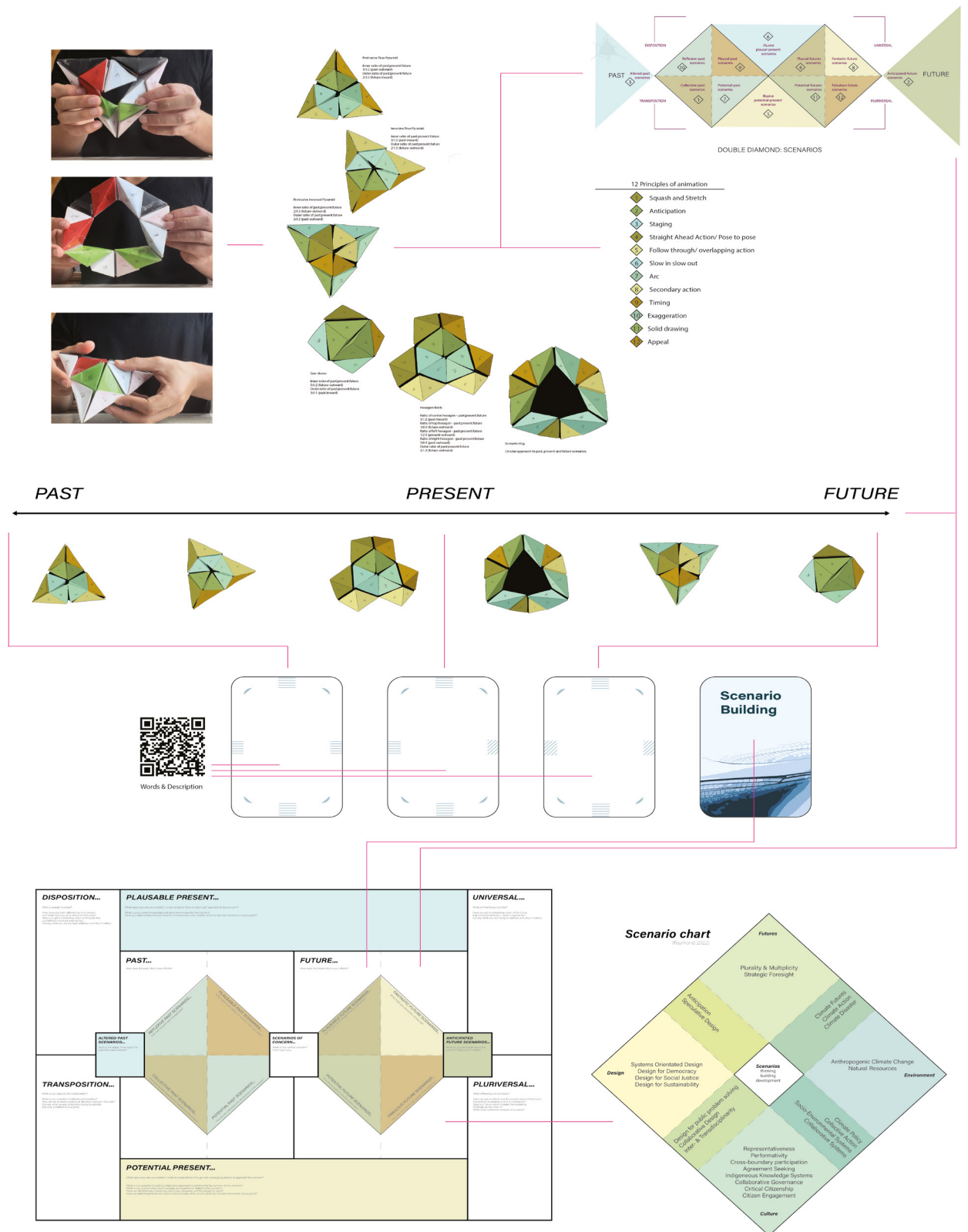
▲ Figure 1: Composite image of elements and connections in developing scenarios across temporal indicators.

project, titled Go With the Flow, that focuses on scenarios, and how the design of scenarios might support collective anticipative futures shaping to inform ways of practising collaborative governance

Scenarios across temporal indicators were explored in Figure 1 through an iterative design process that considered both additive and deductive illustrative techniques, and translations from 2D to 3D modelling. This design process exemplifies research by design approach that informs implications on research for design.

On the top left one can see a scenario thinking 3D object that I designed to explore different configurations of temporal assemblages of scenarios through the manual movement of the artifact. Top middle shows a series of different shapes that can be produced. Annotations were provided to show which of the scenario thematics were more present in a configuration. This oriented some assemblages more in line with a focus on the past, present and future. On the top right is a figure of a double diamond that is used to indicate temporal thematic scenarios that take inspiration from 12 principles of animation.

In the centre of Figure 1, different assemblages associated to past, present and future were abstract to three card types that were used to inform scenario building through play. In addition, a QR code is shown to point to a link to the DESIGN FUTURES LEXICON as the cards used its key terms and were designed for a word-based game genre. Bottom left shows a scenario thinking canvas that is a further iteration of the figure top right. The canvas was intended to capture in-game discussions in contexts of use through annotation (see also Part III of the book). Lastly, bottom right, one sees a spatial scenario typology

represented as a scenario chart that was used to position and reflect on emergent scenarios during a playthrough that made use of the cards and canvas. Overall, designing with time as material informed scenario development that was geared to engage participation around collective futures making.
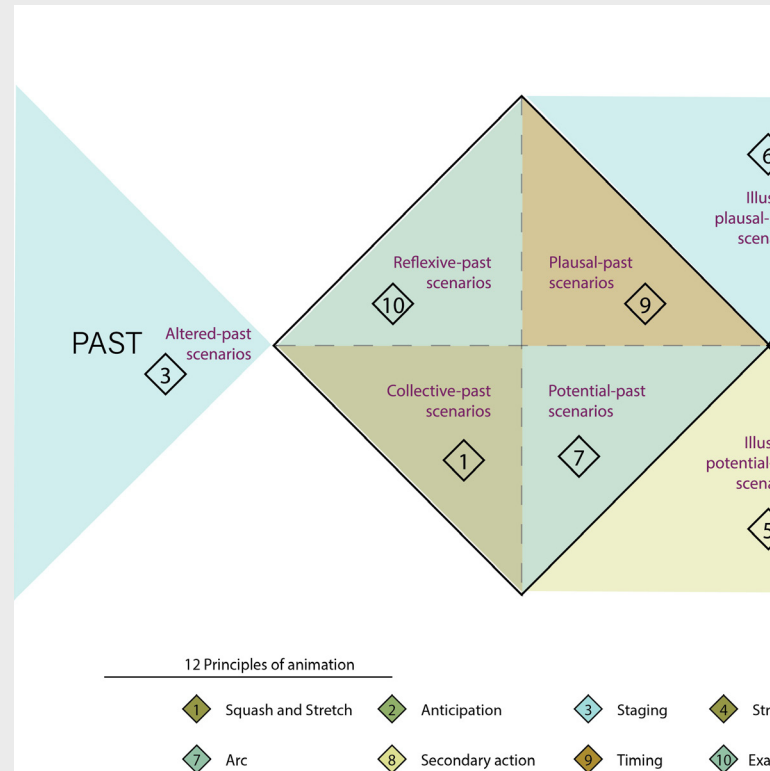
In Figure 2, using the double diamond illustration, scenarios are thematised, such as potential past scenarios and potential futures scenarios, across the temporal indicators of past, present and future. This was done to clarify the role scenarios take up when we engage with the past, present and future. The diagram was segmented in twelve triangles that correlates to twelve principles of animation, as a way of sequencing frames and modes of framing over time.

Translating the twelve 2D triangles to twelve 3D interconnected prisms, made the temporal indicators tangible. From here, performative aspects of

sive
present
arios

Plausal-futures
scenarios ◇4

Fantastic-future
scenarios ◇8

Anticipated-future
scenarios ◇2

FUTURE

Potential-futures
scenarios ◇11

Fabulous-future
scenarios ◇12

sive
-present
arios

aight Ahead Action/ Pose to pose   ◇5 Follow through/ overlapping action   ◇6 Slow in slow out

ggeration   ◇11 Solid drawing   ◇12 Appeal
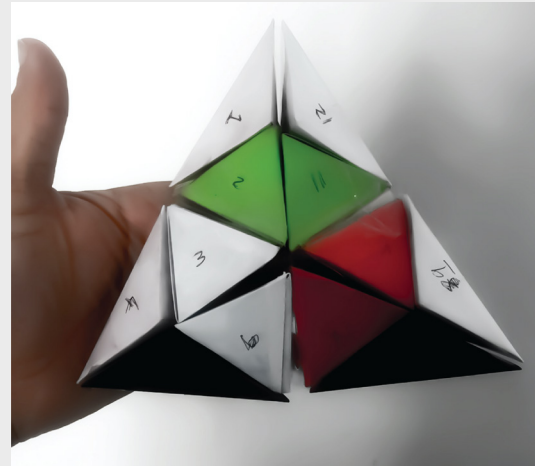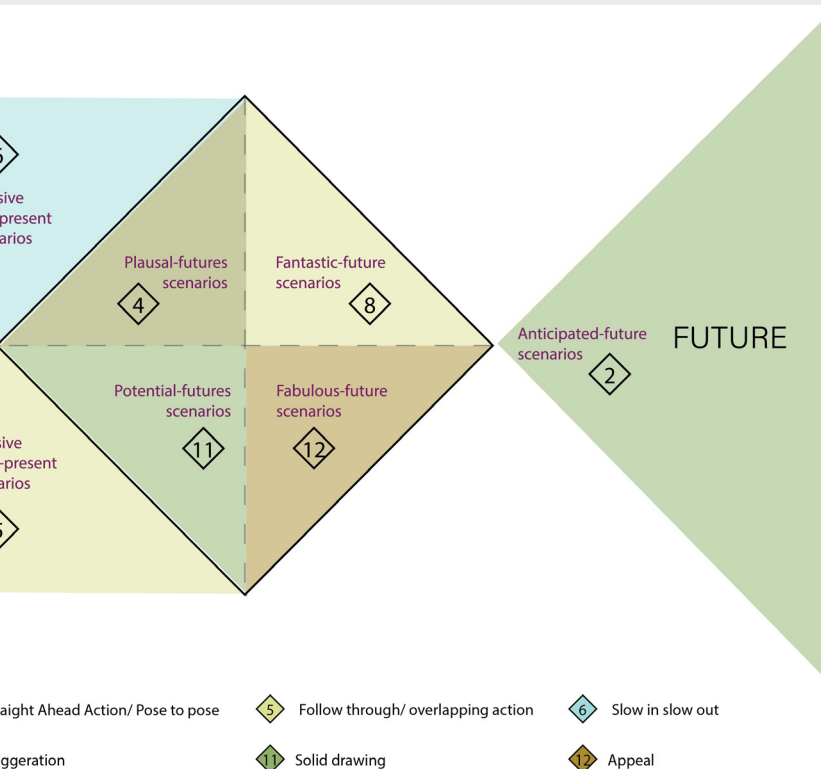
temporal dimensions, topology and
interrelatedness was experienced by
oscillating, folding and juxtaposing the
prisms (see Figure 3).

▲ Figure 2: Adapting and nesting the twelve principles
of animation to identify temporal scenario thematics
(Raymond, Morrison & Mainsah, 2022: 12; above
centre).

▲ Figure 3: Building a model to animate the relational
configurations between temporal scenario thematics
(Raymond, Morrison & Mainsah, 2022: 13; above right).

emerging practices of pedagogical time and learning time. These are aspects of what we term 'chronotopic design futures literacies'. This is not only a matter of thinking pragmatically, methodologically and pedagogically. It is also about how we think about how we think about both design and futures and conceptualising ways time may be articulated further as a design centred futures material. This about how time is shaped by how we label it and position it. It's also to do how notions and practices of time infiltrate and constrain our designerly making and knowing as well as how they may be taken up creatively and critically in altering and opening out shifts away from the constraints of predominant conceptualisations of the temporal towards ones that are more transversally fluid and multidimensionally relational. These are potentials that design education is well primed to turn to and to activate, explore, tousle with and make material in processes and artifacts that materialise them in and through active use, critique and change.

The climate crisis has become compounded in terms of the severity and temporal shifts of weather phenomena and our senses of the temporal have been challenged personally, societally and educationally by the pandemic. Loose, Wittman and Vásquez-Echeverría (2022: 112) outline our disruptive temporal and psychological experience of living through this global and local event with reference to time perspectives as dispositional, cognitive and motivational. They map this in terms of new routines and boredom, uncertainty in waiting and loss of control, the suspension of temporal rituals such as graduations, and the faceless and seamless blending of time differences into unpunctuated daily passing of time where events have no longer demarcated differences and rhythms of life. At play, they propose, are '… dispositional time perspectives would influence state-like reactions in temporal focus and time awareness which would in turn influence how well students are coping with the pandemic.' (Loose, et al., 2022: 113).

Lindström (2022), in a study of residents of a Stockholm suburb, revealed how their different time frames (era, generation, lifetime) and orders of time (linear, circular, spiral), tempos (standstill, rhythm, pace) and timings (juncture, Kairos, de/synchronisation) were both synchronised and desynchronised via the very temporality of the Corona crisis, with social differences contributing to their patterning. In engaging with design futures literacies in the time of a climate crisis and a global pandemic, teachers and students have all become intimately entangled in experiencing and working with time.

Making time, making space for time

Students have a crucial need to learn how to work with time in different forms, durations and contractions. They need to be temporally expressive and chrono topically critical as much as they need to know how political economies of a digital age work with time, in their own logics of capture and accumulation (de Bryn & Lütticken, 2020; Lütticken, 2020). Creative work takes time, it needs time to be elaborated, form ideation through to completed work. Learning time (time for learning). Learning time (learning how time works in design). Time for learning (processes, spaces, boundaries, possibilities). Time

for learning (including temporality as a key part of our content focus on design futures literacies). Reflection, memory and subjectivity take time, there is a need to pause and reconsider, drift, wait and allow matters to surface, for creative and abductive thought processes to arise and for acts of design and their generation to materialise though designing.

Similarly we need to allow acts of going fallow (Kuzmanovic & Gafney, 2017) that allow design learning to have space to regenerate and to not be driven by a mechanics of only productivity and consumption. We need to understand as design educators and students that creativity is core to design futures. 'Time is the fundamental medium and condition of human meanings', writes Hoffman (2011: Kindle). In the context of the Anthropocene, this is key to understanding how nature and the environment use and work with time to grow species and organisms and how designers working with systems, ecology and the environment may bring different and longer-lasting knowledge and values to modernist design models of progress and growth.

However, to do so demands we engage more explicitly in design futures literacies and the workings of time in terms of political economies of design's own making, participation and alteration. Our design futures, our mediated lives and our wider systemic sensibilities are rescaled and reconfigured in and though and as use in a conceit of acceleration and prompting through their temporal scales of participation and logics of further drivers of satisfaction and saturation, always offered just beyond reach in a nearby future, that is as short-term lures ephemerally positioned as beyond satisfaction, or grasp, or understanding. Here as Hylland Eriksen (2011) notes, attention, our own and that of others, is a scare resource. Odell (2021: 14) sees that technologies have 'captured but not cultivated our attention.'

Drawing time together

Timescapes and timeprints, time as design futures material, and design futures scenarios, are three concepts that are worth taking up. Timescapes and timeprints are both concepts that relate to how time is perceived and experienced [→ SEE FEATURE 5]. Time can be viewed as a key design futures material because it is a fundamental element of the design process. By considering a range of design futures scenarios, designers can better anticipate and prepare for the long-term implications of their designs and create designs that are more resilient and adaptable to changing circumstances.

These concepts of timescapes and timeprints, time as design futures material, and design futures scenarios can be drawn together by considering how they relate to the design process and how they can be used to anticipate and prepare for the long-term implications of design decisions. By understanding and incorporating these concepts, designers can create more meaningful, engaging, and sustainable designs.
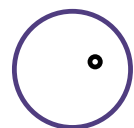
Timescapes and timeprints

BY Andrew Morrison

Time, futures and knowing

In a recent reflection of work as a theorist and sociologist of time, Barbara Adam (2021: 120ff) accentuates that working with time always includes attention to space and matter. This framing she has addressed this through the concept of 'timescape'. For Adam (2021: 121), '… a timescape perspective allows for the complexity of time, engages with dynamic relationships and interdependencies, takes on board invisibility and latency, and insists on the importance of context.' Adam (2021: 120-121) outlines five core concepts in working with and understanding time. These are 1) Timeframe, 2) Temporality, 3) Tempo, 4) Timing, and 5) Temporal modalities. We see that Adams 'Timescape' offers design futures literacies building and related pedagogies with a powerful framing for futures-oriented meaning making by design.

First, 'Timeframe' (bounded forms, extents) places attention on how time is conceptualised and constructed. While such conceptualisations are about a type of periodisation, their frames are nonetheless bounded and are chosen, not given. They are influential. They also become more visible to us in their passing. We begin to see them in relation to one another, less linear, now cyclical, over time reflexive. As a result, our design futures literacies need to be far more connected in understanding choices in terms of positionality.

This is shown in our FUTURE PHILOSOPHICAL PILLS and through the concepts, terms, language, as in the DESIGN FUTURES LEXICON, and related multimodal rhetorics and modes of articulation. Our philosophical and 'language' work offer orientations for designing and design learning through which anticipatory design as critical future making may be realised, shared and engaged with, and taken up and changed in their social material discursive practices. These too need to be appreciated in terms of the timeframes that they constitute and circulate.

The second category, Temporality ('engagement with processes of change') is concerned with actions and systems, such as ageing and grown, says Adam. These are, however, not always explicit as they part of how we live and experience temporality in our being, moving and, of course, designing. Here, in an anticipatory design learning view, we may say that, following Adam, that timeframes are also concerned with rendering explicit matters that are inexplicit and assumed. Thus they work to accentuate the importance of interactive change processes. This 'temporal design surfacing of change', as we see it - in, as and through time - is crucial in an anticipatory design pedagogy and attendant and emergent literacies where space and matter are in our designerly hands as learners and teachers, researchers and professional partners.

The dynamics of such situated acts of becoming, are central to the third of Adam's categories, namely Tempo (speed, paces, rate of change, velocity and intensity). In western capitalist cultures and economies, and very much for designs incarnations of them, speed has come to be a core value and marker of success and achievement, while rates of change may erase other values that are fundamental and deeply located culturally and in terms of longer-term processes of realisation, support and flourishing. Anticipatory design pedagogies and related futures literacies cannot simply be about rapidity and replacement, growth trajectories and industry driven metrics of delivery and intensities of outbidding potentially better products and services in modes of uncritical just-in-time delivery and attendant neo-liberal uncritical promotion of just-in-time learning with our acknowledgment of their consequences and short-termism as regards wider matters of building systems sustainability. Yet our courses and studios and deliverables are time-based and students need to work

with teachers and one another to find their temporal timeframes for every project, product and process, service and systems-oriented design relation.

This leads us to Timing (social synchronisation, co-ordination, good/bad times for action), Adam's fourth category. All design education is developmental and about processes, yet it is also about the timing of components, needs and stages, cycles and recursive and reflexives revisions and reviews. In all of this what is central is that attention to timing, as Adam argues, works to create norms and practices that need to be understood as occurring in locations and in terms of their situatedness. This refers to the values and properties of contexts of making and knowing, and these are historical and biographical as we each work and together strive towards realising responsible, accessible and participative things, tools, processes and temporal accessibility, suitability and purposive timings that need to work to support students as well as future employers and consumers and citizens to engage with the as-yet-to-become that is made manifest in how time is understood and exercised.

Fifth, temporal modalities (past, present, future) also need attention in shaping and articulating the interplay of key aspects of actions, knowledge and ethics (see also Adam & Gtoves 2010). Here we encounter mismatches between these three aspects at various levels. Such mismatches need disambiguation and, above all as Adam argues, action. Central here is distinguishing between what she labels implicit assumptions and affecting actions. Key also is to understand mismatches between the temporal modalities of actionable effect and institutional structures, and between what she terms implicit assumptions, conceptualisations, theories and methodologies. Adam reminds us that

processes are interconnected, shifting between relations of past, present and future, and that we need to be actively and intentionally engaged in determining boundaries and cut-off points in how processes are framed, formed, in how they run and reveal affects in and through time. In terms of anticipatory designing, as Adam also argues, this is a matter of engaging with 'the not-yet', knowledge of which can only be holistically garnered when we have completed actions and results. This has durative reach when we look to working towards responsible and ethical long-lasting effects in which human and non-human actors and systems are entwined and together shape processes of marking and making timeprints themselves.

Responsibility for 'timeprints'

FUEL4DESIGN has sought to do this in and between and across its 'intellectual outputs' (IOs). In an anticipatory design pedagogy, this is also about heightening linked awareness in points of view, whether positional of as in our work on scouting on first-person perspectives, and focus on implicit assumptions around design and futures tools and methods. This is especially so where these are driven by framings and practices of working chronotopically from outside design. Here strategy and planning assumptions inherited from approaches to Futures Studies and the overarching reach of inherited ontologies of foresight may not be located within temporal modalities of designing, creative and imaginative critically situated re/making.

Adam (2021: 127) notes that 'We have to think about responsibility for the future in analogy to responsibility for actions in the present'. This would mean that we take responsibility she argues not just for actions that extend to space (footprints) but to ones that extend over time that she calls 'timeprints'. A partly overlapping taxonomy to that of Adam is proposed by Hall and Baker (2021). It also resonates with aspects, for example addressed in our own FUTURE PHILOSOPHICAL PILLS in addressing relations between notions and futures of 'salvation' concerning climate change and view on the apocalyptic. Hall and Baker (2021: 227) chart ideologies and enactments of time and related social organisation as follows: Diachronic time (clock, calendar), Synchronic time (of community), Strategic time (competition, conflict), Pre-apocalyptic time (present times), Post-apocalyptic transition (intermediate time), and Time as eternity (utopia, durative). Both of these mappings encapsulate that time is a complex, dynamic and spatial construct that is material, immaterial, historical, situated and imaginary.

One major problem is that regulatory procedures and policies, legal and professional, have not been devised to account for what is to come and what is not yet signalled and (Figure 1) materialised. Adam (2021) sees this as a key need to address in order to develop responsible actions to counter our practices and assumptions that so clearly threaten our lives and that of a long-term humanity and planet. This asks that we serious address our assumption. As our work on the FUTURE PHILOSOPHICAL PILLS makes manifest, this is a matter of being able to identify, critique and select and apply world views, concepts and develop clear positions to locate and enact our design ontologies. In terms of timeprints, this raises issues and enactments about ethics (see also Essay 2: Altering Prospective design Pedagogies). It's time design moved from timing its work to working with time. Anticipatory designing may benefit from experimenting with the notion of 'design times'.
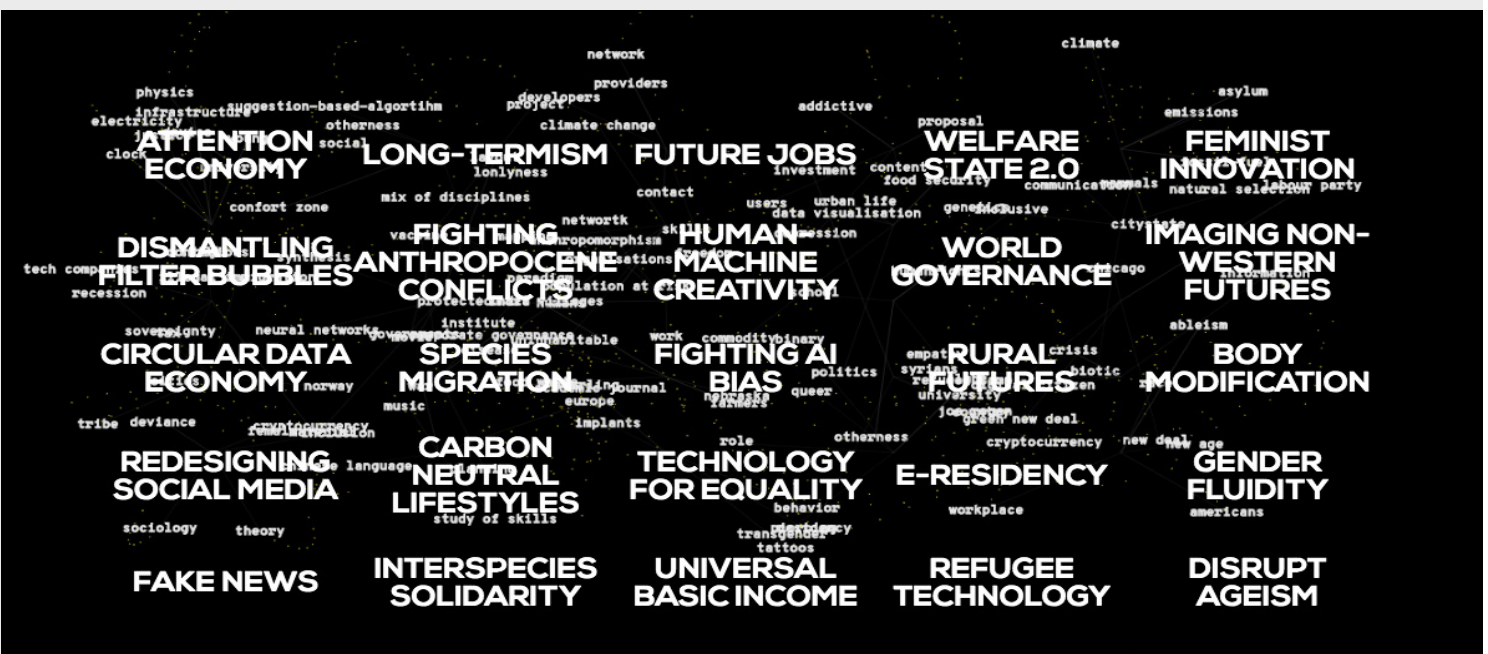
▲ Figure 1: Still shot of a dynamic visualisation of the atlas of 25 weak signals and the related key-terms.1 Built on a corpus of academic research, data scraping, and keyword mapping with machine learning, the 25 different weak signals and various key-terms are associated with each weak signal. Master's in Design for Emergent Futures (ELISAVA, IAAC). (Image credit: Fab Lab Barcelona). **Link** ↗.

4.
Time as design futures material/ity

BY Andrew Morrison

Time, materiality and designing

As an analytical tool for unpacking the set of relationships between human beings and time, time-tricking refers, amongst other things, to the development of individual, intersubjective and collective strategies for stretching and bending time in relation to one's needs, preoccupations and 'deadlines'; for making sense of both unexpected changes in well-established temporal frameworks and conflicts between contradicting time-frames and temporal orders; and for creating and maintaining alternative ideas about time. (Moroşanu & Ringel, 2016: 18).

Changing materialities

Our ideas about what constitutes material in design and designing have changed as design has evolved, shifting from craft to digital interaction. In such shifts the interplay between materials, means and mediations have also changed as designers and design researchers explore and innovate with interplays of materials and altered notions of relations between the immaterial and material. In FUEL4DESIGN, with its intentions to work with face-to-face and physical-digital relations of making and knowing overtaken by a global pandemic and subsequent work-arounds to support, motivate and facilitate student learning about design futures, design materials became a key matter of debate and dialogue.

In these transpositions of our intended pedagogies in the context of a digital pivot, time as a design material emerged as one of our own shared points of focus. As Manzini (1986) has argued there is a potential mismatch between emerging materials, their complexity and how we are able to think with and through them as designers as well as more widely in cultural terms. Time as a design material is characterised by it being comprised of multiple framings in the shape of timescapes and timescales. Where design futures are posed in an anticipatory learning mode - characterised by emergence, what-if to what then potentials and preferences – attention to tome and to working with time as a design material becomes a central resource in shaping our futures literacies.

An earlier PhD in interaction design at AHO by Nordby (2011) looked into RFID technology as a computational design material. He looked at this in terms of related research in interaction design that had viewed information technology as a material without qualities (Löwgren & Stolterman, 1998). Attention to the mediation of such design

through spatial material had also been mentioned by Hallnäs and Redström (2006). Nordby (2011: 4) observed that.

Karana et al. (2008) found that for designers, materials play a significant role in both the final production of the design and the important process of supporting the conceptualisations of new ideas. This positions materials, from a design perspective, as both the enabler of the final artefact and the enabler of ideas.

Time as an anticipatory design material

Below are some of the issues that arose in our deliberation as students and supervisors in PhD work we feature in this essay **[→ SEE FEATURE 6]**:

In what ways might we understand time as an anticipatory design material?

How was this being taken up in doctoral research that connects making with temporal material and developing related analyses?

In what ways was time as a design material impacting contextually on how PhD students were able to continue to work with and across timescales and to be able to engage back in the world as the lockdown restrictions were eased?

How was time 'captured', mediated and unfurled in processes of making sense and meaning through designing?

Conceptualisations of time (Adam, 2004) are inherent in all cultures, languages and designs. However, design has not centred much on time - as a medium and material - as it has other aspects of the human sciences where time has been researched and taught in often intersecting domains such as philosophy and religious studies, narrative and film studies, sociology and anthropology. In just one respect, concerning design activism, Abdulla (2021: online) reminds us to be vigilant about temporal practices:

Activism and politics require time—time designers are working against. Our world is all about instantaneous decision-making, leaving us with no time to sit and think critically about our work. We have lost the time to think. Designers—due to the nature and speed of the industry—have never been allocated the time to think. Perhaps this is where we begin to contribute to solving the pressing problems we've contributed, and continue to contribute to creating. Being political is an add-on, something that is tolerated as long as it is a side passion project.

PhD learning, with focus on time on site

BY Corbin Raymond

PHD WORKING TITLE: Go with the Flow

SUPERVISORS: Prof Andrew Morrison (AHO)
& Prof Elmarie Costandius (Stellenbosch University)

Below are my notes from recent fieldwork in the Western Cape in South Africa with CoGo, an NGO that works on Collaborative Governance for Water Security, April-September 2022.

Decolonising points to the pluriversal, and is less about returning to a pre-colonial society, and more about recognising that we live under a colonial system (Escobar, 2019: 22). Those things are the way they are, not by accident, but because a particular ideology has systematically erased others, while normalising itself. Once something is normalised, it is hard to imagine anything else.

The capacity to imagine, futures in particular, stems from the ideologies that are informed by our respective world views (Escobar, 2019: 19). This creates a particular tension within the Futures discourse on whose futures and who is doing the futuring, and with whom. Futures for the real world, by implication, is therefore a matter of futuring with others and calls for collaborative and participative methods and practices. As designers, our futuring processes need to reflect ways of including different and diverse futures imaginaries. This feature article will reflect on field work done for my PhD study and propose three concepts related to states of flow: entering the flow, designing in flow, and shaping the flow. The context of my fieldwork is in a post-apartheid South African water-context with indigenous people, local NGOs, government actors and corporates.

Why water and time?

The present is a representation of past futures and matters around climate change as well as the socio-ecological find a particular discourse on justice within third-wave feminist theory (Ackerly & true, 2010: 464). The redirection of social responsibility to create more equitable, inclusive, fair and just futures sways between governing institutions and the everyday citizen. Neoliberalism is an economic and policy ideology that brings forward notions of

self-regulatory systems. As opposed to the preceding government-centric regulatory systems of Keynesianism as the dominant economic and policy-making period between 1945 and 1970 (Palley, 2005: 2).

These ideologies were normalised during their respective periods and has contributed to marginalisation, exclusion and misrepresentation of the people their ideologies affect, and correlates to third-wave feminist theory that calls for othering our ideologies and world views.

Indigenous Knowledge Systems, in response to the transnational world views that have shaped our present, are emerging in the field of futures studies to imagine the future in different ways - to put a futuring emphasis on those who have been marginalised and misrepresented in the past (Barnhardt & Kawagley, 2005: 9). Contemporary notions of decolonising the future are taken up by questions related to who's future, and who is doing the futuring.

▲ Figure 1: Panoramic view of the Breede River Catchment, Cape Province, South Africa.

Therefore, by contextualising the futuring practices of anticipating, shaping, imagining, enacting and performing in situ, I explore three main futures-facing approaches. These are the conventional bottom-up, middle-out and top-down approaches. In the current state of social systems, citizens are governed by regional, national and transnational policies. This implies a hierarchical order scaffold where, from a bottom-up approach, citizens are putting their imagined futures forward to influence the policies that govern, realise and actualise them on a larger scale (Bhavnani et al., 2019).

The middle out is taken up by actors with particular agency to work across the grassroot level as well as leveraging from direct potential to influence policy and decision makers - most notably NGOs and other civic groups. The top-down approaches are on a policy domain which

can be most notably seen in relation to the United Nations Sustainable Development Goals that inform desired futures on a policy domain. All three approaches happen autonomously, in real time, in and for the real world, and pertain particularly to matters of coordination between these futures-facing approaches.

Therefore, coordinating autonomous action across these diverse approaches is taken up by collaborative governance as a means to shape futures across these three approaches. As a key concept of Collaborative Governance is on coordinated actions (Greenwood, Singer & Willis, 2021: 46).

My PhD research explores matters of collective and anticipative futures making by scenarios to inform the practice of collaborative governance in a South African water-context. As part of my fieldwork, I have closely worked with an NGO called Collaborative Governance for Water Security (CoGo) that is based in Stellenbosch, South Africa. I am a co-founder and executive director of CoGo and have worked on establishing CoGo since 2018, with formal registration done in 2020.

Since CoGo's registration, the NGO has taken up a middle-out approach to influence policy and policy decision makers in the water sector, as well as reaching out to several communities who are key role players in the Stellenbosch. The motivation to establish CoGo comes in response to the 2017 drought that brought about a water crisis in the Western Cape province of South Africa. During the drought, marginalised communities were the most at-risk and lower water tables accelerated the deterioration flow rates and river health.

Water offers perspectives to how we look through the past, present and future states of flow. Water is a reflexive material that puts emphasis on human-nature relations by offering a speculative focus on societal actions and behaviours.

The state and health of water flow reflect the interconnected water nexus of agriculture, health and energy practices and offers a futures-framing capacity for multiple actors and stakeholder-engagement through past, present and futures scenario based inquiry.

Concept 1: Entering the flow

This section will reflect on my experiences in situ and how, by going with the flow, I identified participants for my research activities that, firstly, included a focus group with visual communication designers to test and further develop scenario building cards, as well as a scenario thinking canvas, and secondly, included three activity workshops with participants testing and using the scenario building cards and canvas. Here, going with the flow means entering a context, without any preconceived agenda, and just showing up at events that relate to the topic and project thematic, by scanning the inertia of existing flow. In order to identify who is doing what, and where I fit in.

On 11 May 2022, CoGo received an invitation to attended and participated in the Breede Knowledge Exchange and Learning Day (KELD) that was held at Wolesley, South Africa. Figure 1 is a picture I took from my phone while attending this KELD event that offered me the first opportunity to engage in a water catchment context with other middle-out roleplayers. The 'Knowledge Exchange and Learning Day' was co-hosted by African Climate and Development Initiative (ACDI) at the University of Cape Town, the Centre for Sustainability Transitions (CST) at Stellenbosch University, and the non-

government organisation, LivingLands. Here I further participated in a facilitated walkabout, see figure 2, and an informal discussion with a soil scientist went in the direction of scenarios and probing time.

The soil scientist reflected on a probing practice they do to collect soil samples beneath sentimental layers, from which they can assess microparticles of animal biowaste and pollen. From these assessments they deduce the biodiversity of a given site or region and form a basis to evaluate the migration, expansion or loss of biodiversity on the site. By probing the past, and comparing it to the present, their line of work draws on comparative scenarios to inform the governance of conservation and informs protective land acts on a policy decision-making scale.

This conversation made me reflect on the specific tools we, as designers, might use to probe the past, present and future as a way to anticipate, imagine and speculate by mode of comparative scenarios.

By seeing probing as a way of interfacing with the temporal, Futuring becomes less a matter of time but more so the relation with time, where temporal relations surface opportunities for meaning -, sense - and place making. Thereby they conceptually frame scenarios as an interface for temporal relations that surface meaning -, place - and sense-making opportunities.

Experiencing the middle out

Since I went to South Africa in April 2022 for my fieldwork, I attended in-person and virtual meetings with CoGo and the department of water and sanitation (DWS), where the acting director of DWS service support expressed that they have failed to improve the health of urban rivers and needed the input and support of a key implementing partner like CoGo to mediate government initiatives such as the 'Adopt a River' campaign with other key role players that included schools, other NGOs, corporates and local community members.

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In Figure 3 there is a three-tile image where on the left I can be seen collecting samples for a miniSAS in the Lourensford River. This river falls under the Stellenbosch River catchment area and on the 18th of July 2022, became the site, identified by the DWS, for the 'Adopt a River' kickoff event. In the middle tile, I am being guided by a member of the Mbeko Eco Club, a local NGO that focuses on outdoor classrooms for river health monitoring, to transfer the collected macroinvertebrates into an observation tray. Thereafter a group of youth community volunteers participated in observing, identifying and evaluating the river health by using the miniSASS method. A miniSASS is a simple tool which can be used by anyone to monitor the health of a river. You collect a sample of macroinvertebrates (small animals) from the water, and depending on which groups are found, you have a measure of the general river health and water quality in that river.

Several river cleanup events happened during my fieldwork, with the most notable being the World Rivers Day Symposium, held on 27 September 2022. The event was hosted by DWS and invited NGOs, community leaders, citizens and government officials, which included regional counsellors and the national deputy minister of DWS. At the Symposium I shared insights and reflections of my PhD research and fieldwork. This included reflections on the state of river health monitoring through miniSASS, as well as scenario driven approaches to collectively shape water futures by means of scenarios. At the event I could reconnect with participants at KELD as well as the river cleanup days, and briefly spoke about the scenario building cards I was developing for my research. There was growing uptake from all parties to participate in the activity workshops.

During the six months of my fieldwork period, I have also been involved in planning meetings with CoGo to do proposal writing for research projects, such as the River Cities as Method project, UNESCO and others. As well as participating at activity workshop events with grassroot actors in the river catchment areas in Stellenbosch and its periphery. Continuous engagement and deep participation formed part of the activities of participating in a community event based process, workshops, walkabouts and speaking platforms. Where the act of showing up at events that extend beyond my own project scope deals with matters of recurrence, sensing trends and identifying key roleplayers. This reminded me of a rather gamified experience where returning and reconnecting to a site and people continuously change over time. Peer-to-peer learning took place, where at the beginning of my contact time with people I had to introduce concepts of Futures, Design, anticipation and scenarios through informal dialogue, I started to notice I was being introduced to other community members and NGO groups, by political leaders who were now speaking and framing futures, anticipation and scenarios at key events. I noticed in shared car rides back and from events with colleagues that I started to identify invasive alien plant species and spoke of miniSASS with water scientists and environmental policies with environmental lawyers.

On Wednesday 21 September, I had an informal interview with a South African soil scientist that specialises in Geostatistics and agricultural Hydrology who told me about a First Nations community group that reached out to him for research support. As he recently retired from Stellenbosch University, and did not have the personal capacity to lead a project. However, he continued to inform me

about this First Nations group located in Foure, with a specific feature on the site that acted as a gathering place, which he loosely called 'sacred stones' (Figure 4). To his knowledge, this meeting place was where people gathered to discuss social and environmental matters and might have been the first-known account of a parliament in Southern Africa. He shared the contact information of someone who acts as a community representative for the Indigenous group in Faure and who could arrange a meeting with the tribal leader to visit the sacred stones site. Faure is an historic outpost that connected a trading route between the Boland region and Cape Town. In present day. Faure is a peripheral suburb between the City of Cape Town and Stellenbosch district municipality and among other interests, features the dilapidated bridge that was a key feature of the old trading route. This site offered border tensions between people groups, municipal zones, and the spatio-temporal.

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I presented the Faure community to the CoGo members as an opportunity to reach out to an Indigineous group to engage in a community-based futures inquiry to identify a possible river health project to collaborate on. One of the directors knew the community representative at Faure and on 26 September 2022 we had a site visit.

The intention of the kickoff meeting was to identify a site related problematic from where co-writing a project proposal would follow. The indigenous group leader expressed how water flows in the area and where it is obstructed by alien invasive plant species and illegal human interventions of fences through the river (see Figure 5). This raised particular concerns as the biodiversity of animal and fish species were affected by the deterioration of the river health, as well as recreational and spiritual activities performed by indigenous people were being compromised by competitive land development activities.

This disruption of flow raised implications on human health based on the access and availability of water but it also opened up a speculative dialogue for the imaginaries to come forward. The First Nations group could reflect on the past to talk about the health of the river before, how the former bridge connected them to a historic trade post and the livelihood the flow of water sustained in relation to its current state and practices along the river.

Concept 2: Designing in flow

Following is a series of field notes, images and reflections. In my case, this fieldwork acts as an in situ orientation to a workshop series that explores scenario building through a mode of play. Where play, as a mode of knowledge shaping in relation to Indiginious Knowledge systems, informs sense - and meaning making when applied to collective futures imaginaries.

Figure 6 shows the focus group with the Visual Communication Designers seated on the right side of the table, and a copywriter on the left side. The copywriter had two roles. Firstly, he was tasked to work through the appropriateness of the 50 words and their definition, from the DESIGN FUTURES LEXICON, for a South African context, and secondly, to evaluate the clarity of instructive copy on the playing face of the word-based cards, and the scenario thinking canvas. The Visual Communication Designers were tasked to explore the general user experience, visualisation techniques, gaming mechanics and to test the playability on both A3 and A2 scenario thinking canvases. This focus group took place on 23 September 2022 in Stellenbosch in preparation for the Activity Workshops that explored the scenarios building cards and canvas. The necessary changes were made to the cards and the canvas based on the feedback from the focus group and three Activity workshops followed

The first was with CoGo on September 29, 2022, the second was held on October 4, 2022, with the design and innovation team at Distell, a corporate and big wine producer in Stellenbosch that relies on agricultural practices that depend on the Eerste River for irrigation and production, and the third was with the Faure Indiginious Group and Cogo that was held on 6 October 2022 at the Stellenbosch Sustainability Institute near the Eerste River. Because the scenario thinking canvas and the scenario cards were designed for tabletop play, the venues for the three workshops happened indoors where tabletop play could be facilitated. In Figure 7, I can be seen sharing a brief overview of the gameplay and introducing the scenario building cards and canvas to the participants.

In Figure 8 one of the participants can be seen holding the Participative card in his

hand. The participant is discussing and reflecting on where to place the card based on what other players have played before. The cards were designed with three distinctive patterns on the borders, and players were tasked to match these patterns between the cards. By matching the patterns, players were creating contiguous relations, collectively shaping and building scenarios and allowing their conceptual futuring to flow beyond the physical borders of each card.

This matching mechanic was complemented by dialogical and discursive roleplaying, prompted by the what if counterfactual narrative technique. Discussion points were annotated on the scenario thinking canvas.

Concept 3: Shaping the flow

During my field work, the health and flow of rivers were taken up by the indigenous group in Faure, the NGO as well as the national DWS to inform decision-making practices and processes.

From the Adopt a River campaign to a series of three scenario building activity workshops that I facilitated as part of a discursive explorative gathering, titled Sacred Stones.

Sacred Stones as a participative space was scaffolded around bringing people together around matters of futures, by inviting open, respectful, empathic and discursive dialogue to inform a series of actions.

During the Sacred Stones events, there was an intrinsic value in identifying water as an opportunity to engage with spatio-temporal perceptions, experience and practices as well as cross and transdisciplinary engagement with a futures framing approach. Such as anticipation and speculating.

During the conversations I had with people they would say, I remember when I could still swim in the river but I wouldn't want to do that now. Critical reflections on pasts and memory, with a water focus, is an affordance to inform decision-making processes by accentuating the capacity to imagine futures from the ideologies that inform our world views.

Therefore we need to be critical about how we might probe the past, present and future. These orientations to temporal relations and how we go about collectively shaping scenarios require deep participation, methodologically.
A key reflection on my fieldwork is that as river banks shape and are shaped by the flow of water, so too are we being shaped by and are shaping the flow of time. We collaborate with, resist and anticipate the inertia of the temporal as it forces and nudges critical decisions through design and research processes.

I think that in our relation with time and temporality there are specific tensions that motivate our decision-making processes, be it cultural or physical borders, preventing or hindering our state of flow. Ultimately, these notes on my fieldwork was to explore the capacity to imagine futures from different world views, and I was gifted with a vibrant and rich research site, diverse group of actors and participants and, of course, the Sacred Stones.

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▶ Figure 7: 'Sacred Stones' activity workshop - Briefly introducing the scenario building resources (top).

▶ Figure 8: 'Sacred Stones' activity workshop - Playing with relations and flow (bottom).
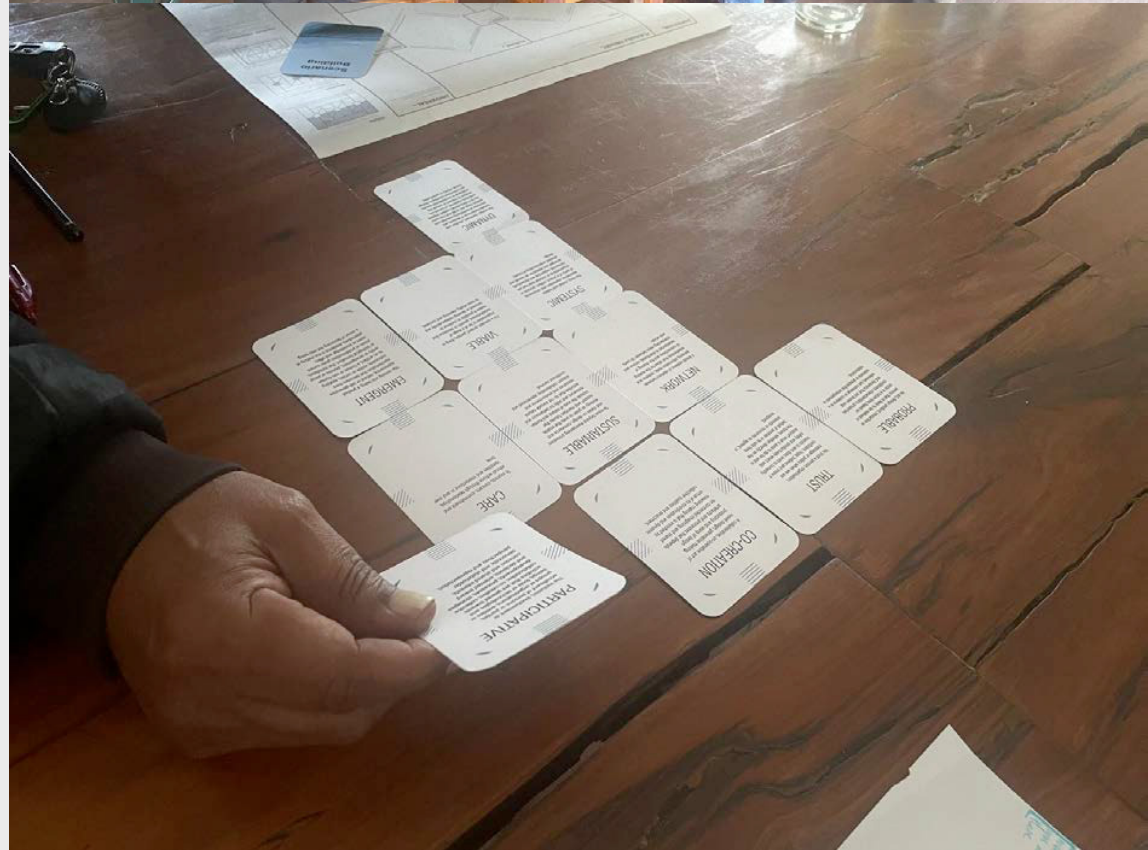
5.
Design, time and anticipatory pedagogies

BY Andrew Morrison

The challenge is never simply to resolve a problem, to identify and stick to a pathway, for the constant reorganization of planetary forces will keep throwing up new problems, opening up new pathways and closing down old ones. New things, new practices, new earthly multitudes will coalesce and gather support 'only by interaction in an environment that has yet to be'. There are indeed very urgent global and local problems we currently face – but forging new planetary futures is also a matter of making time. And that, we have been suggesting, requires a deep, explorative and imaginative approach to the varied ways in which our species has joined forces with the Earth, together with an appreciation of the way our planet goes about its own, active, temporizing.

(Clark & Szerszynski, 2020: Kindle).

Beyond 'now'

Time is essential for all life to flourish. As Hoffman (2011: Kindle) observed, in our bureaucratic, machinistic march to time, we have forgotten tempo giusto, the unrushed time of childhood, and all that play and the flow of living bring to growth, change and learning. Not only do we need time to learn and to make memories, literally in our neurological and psychological human selves, but so too do the signal systems and plant ecological temporalities of abundance and regrowth. The quote above form Clark and Szerszynski (2020) reminds us that our human notions of time - fuelled by 20th-century modes of mastery, planning, strategic decision-making and exponential growth driven economic logics - no longer hold as we are entangled in the deep time of our being joined with the planet. We might indeed look to how time was altered in our online and pandemic journeys, (e.g. Robertson et al., 2022) as the navigational of liminal experiences and chronologies and discuss what s we must and might change our current pedagogical practices and their temporal materialities.

We will continue to need to work with time as a design material and we see there being rich possibilities for exploratory projects by master's and doctoral students here. However, we need to heed the caution of fellow travellers, such as the ERSAMUS+ funded *Speculative.edu*, who remind us that the metrics of design education has strong drivers and well-worn pathways and that transition to change, and temporally shaped ones, are difficult (**Link** ↗), and anticipatorially so. Perhaps we need to look at disrupting cognitive temporal representational tools and expectations and experiences of time in design learning and processes, along the lines adopted by Birth (2022), such as disrupting the 'now' to help students to think about time in new ways.

In our pursuit of design futures literacies across FUEL4DESIGN, we have all experienced temporality and teaching and learning anew and with all its pandemic and anthropocenic disruptions. As we all go forward into the second quarter of the 21st century, we hope that our colleagues world-wide will be able to continue to focus on time as a design material in shaping pluriversal and relational strength in teaching and researching. We see that it is fruitful to bring time into activities of learning that make time matter and remake matters temporally so as to contribute to our near and distant anticipatory design futures.

Shaping temporalities

In summary, in postnormal times (Sardar 2021) and in an anticipatory design view, futures are clearly plural and the temporal is central as material and process. Temporal literacies include futures ones and they need to be materialised conceptually and culturally so that we include diverse notions of design narratives and design mediated futures that work not only with interfaces and mobile technologies but dimensionalities of the chronotopic (that engage human and non-human personas and imaginary and hybrids of physical and digital worlding by story making, play and gaming. This needs to be contextualised in terms of both the legacies (Hendon & Massey, 2019a) and ways the past inform the present and the future via design and experiences of time in the present. This is all crucial if we are to work through acts of designing, with participants to design based events and in variously framed analyses of them. It asks that we consider how we work with time in its diverse conceptualisations. It requires us to engage with cultural, structural and processual aspects of design and time.

For example, in introducing their edited collection *Design*, *History and Time: New temporalities in a digital age*, Hendon and Massey (2019) ask 'how designers, design historians and design theorists might respond to the global challenges of time, the rhythms of work, the increasing speed of life and communication between different communities' and that that this occurs 'In the current era of rapid prototyping and slow design' and 'the changing nature of time in relation to design history'.

This points to how we work with time - within between and across timescales - in shaping design futures engagment dynamics of bringing that back to effects and affective presents. These are ones that need to be projected, with modesty and imagination, with purpose and choice, into unknown and emergent futures. These are futures that are longer term than our current often limited and even myopic perspectives on the temporal and on consequences for future generations. Adam (2021: 122) writes that, 'I have come to realise further that the way we organise and produce knowledge has to change in a world where everything connects to everything else, where the impacts of actions extend to the furthest reaches of the world and affect untold generations of future beings.' She continues to say that 'Everything we do in our life is not just embedded in a socio-biographical past but also extends into a socio-environmental future'.

Social science researchers have argued that we also attend to the social life of time. Bastian et al. (2020: 290) note that:

... for a social life of time, we need to understand both of the moves suggested by Law et al. as working together: that is, in order to understand the social life of time we need to hold together both the ways that time organises the social and that time is of the social. If we do not understand time as of the social, then the politics of time, the politics of time's role in organizing the social worlds that also constitute it, remains hidden.

For design futures education and futures of design education, design as material, processes and experiences also point to it needing to be understood in terms of ways time organises design socially and how design will need to also increasingly work with the temporal in specially oriented aspects of designing and its intention to emergent ecological, posthumanist and A.I infleced and even driven developments, critically and constructively.

We are already embeeed in such systemic relations; our design futures literacies must entail multitemporal and relational approaches and analyses in working with time and in and through it.

As Bastian et al. (2020: 290) further argue, a key interest is to take '... a more critical look at the way time produces and performs some realities while shutting down others, precisely through the way it organises and constitutes social life'. As Bastian et al. (2020. 291) also point out, referring to Latour (2005), this is about unpacking 'time as uneven and unequal relationality':

What form of relationality is a particular manifestation of time enacting? Who is included and who is excluded? Who appears, who disappears? Who has agency and who doesn't? What entities are aligned, and in what ways, in order for this experience of time to arise? Why one particular uneven configuration and not others? Who benefits and who suffers? And who gets to decide?

This raises a number of important matters for design education in and as shaping futures, concerning futures takes on design and who is constituting the temporal and to what ends, and design in futuring as methods and methodologies, tools and techniques, and in terms, in designing decolonised futures as intentional, exploratory and respectful plural perspectives on alternatives to already unequal presents shaped by their design legacies and political economic cultural means and manifestations.

Time, needs and values

This unacknowledged temporal turn is dedicated to a politics of time that has at its core the reclamation of time. To reclaim time is not to harness certainty but rather to refuse the dictates of heteronormative, white, productive, and capitalist systems of power. To reclaim time is to seek to exist outside of the dominant temporal order rather than find a way to get back in time. But to reclaim time is not to catapult into a new novel temporal order. Rather, it is to continue to name the chronometers of social control, reckon with how these chronometers work so well together, and figure out how they can be both struggled against and joyfully averted. (Sharma, 2022: 47)

This means we do indeed have to look into how time may operate in ways the future is being framed and, indeed, colonised by current practices together with previous policies and social and organisational behaviours. It also asks that we look then at how we take up, position and claim time as a component and 'actor' in the shaping of our societal and design futures literacies.

Matters of how we perceive, 'occupy' and represent time are taken up in an essay by philosopher Michael Soteriou in the project *Sense of Time* (**Link** ↗). Soteriou asks:

> *… if alternative ways of representing and thinking about time are open to us, how might the adoption of those alternatives affect and influence how we occupy time? Such reflection can also give rise to a design challenge: what are the ways of representing time that best serve our needs and values? And the attempt to address that design challenge falls to a more fundamental question: what are our needs and values?*

For design education to take up these questions demands that we dig far more deeply into what time is and does and might be in terms of the needs of our programmes, worksplaces and partnerships. It also challenges us to look closely at the values that our current educational, research and professional trajectories are built upon and assume, what is promoted and projected and how this is all to often only implicitly framed and taken up and apart in term of a what we call 'chronotopics of design futures pedagogy'.

> *In the context of future studies, the chronotope is seen as both an analytical tool and an underlying structure of the "anticipatory models that motivate present action and make it meaningful" (Tuomi, 2019). Whereas the kairos moment becomes an incentive for imagining or modelling an anticipated future, chronotopic imagination molds the future into tangible shapes that reproduce, extend or transform current practices. (Grishakova, et al., 2022: 10).*

Effecting susbtantive, deep change demands breaking with recent norms and centuries of perspectives and practices. These changes challenge our social, political and legal assumptions, engagements and arrangements (Adam 121: 128). Central here is work needed on understanding what Adam (2021: 129) calls the 'temporal reach' of our actions. Valkenberg (2022) discusses this in terms of time and epistemic justice. He concludes that urgent attention be paid to the consequentialness of time for epistemic justice, noting that:

> *Upon the long-standing tradition of sociology of time, it is perhaps even somewhat surprising that governance systems do not typically have any take on how time is to be governed, nor how time is a foundation of the interventions they make.*

Anticipatory Design is about creativity and communication across timescales and within and beyond current timeprints and temporally framed practices, policies and governance. It asks that design students see options through speculative work, connected when appropriate to backcasting to a 'thick present', that is 'a tentacular web of troubling relations that matter now' (2016: 2; Willis, 2014). This is also a present that is entangled with the past and is important for it allows us to work to clarify how we

are interconnected, positively and negatively. Students who with their design educators may experience waves of development in design, such as the techno-optimism of interaction design and the market-driven characteristics of earlier service design, need to engage actively in developing their alternate presents and to see implications in dialogue with others and in relation to the core topics of one's own work [Figure 4].

Anticipatory design, anticipatory times

Atenatas (2020: 317) observes that

> *The lockdown has thus been a moment of simplification-unification of social temporality, but on a background of discordant temporalities. Underlying the sudden deceleration of our subjective experience is a decoupled and unstructured temporality that reveals the contradictions of global capitalism.*

Such anticipatory designing will expose tensions and potential difficulties. It may demand additional rounds of designing and a sensitivity to how to work with complex change processes in which long-term directions are embodied in the apparently actual, if still projected futures that might transpire (Figure 4). This anticipatory designing needs care for the rise of discomfort and perhaps additional uncertainty as students and their teachers continue to engage with emerging change processes - in, as and for time - in contrast to modernist certainties of change as linear and achievable progression and design's claims to be solution-centred without critical, reflexive and prospective attention to how time for change passes us by and how a politics of designing visions for the future is inescapable (Mazé, 2019).

In autumn 2022, European countries were faced with an energy crisis on top of and partly caused by the Russian invasion of Ukraine. Exposed is the role of fossil fuels and geostrategic and political decision-making in shaping societies and economies, including design and design education. Developing design futures literacies on time and in time is a critical need for our curricula, programmes and practices, in our research and in how we conceptualise and investigate our futured in research through design. Design education may in time also reveal more for other domains and disciplines as to how to work ethically and creatively with time as a design and futures material for long-term visions and for values that are supportable when what is being taught, designed and researched has deep consequences for human and non-human survival.

We are learning to tell the time again. We live in multi-scalar times. Perhaps we can go as far as to argue that we are engaged in reconfiguring design time just when we are learning painfully that we do not control deep time. This is a time of anthropocenic and critical design futures literacies, awareness and action (Celi & Colombi, 2019). There is an apparent, pressing and potentially productive space to learn together by designing and thereby emboldening critical creative chronotopic design futures pedagogies that will help us understand and work towards shaping long-term sustainable and vibrant planetary futures.
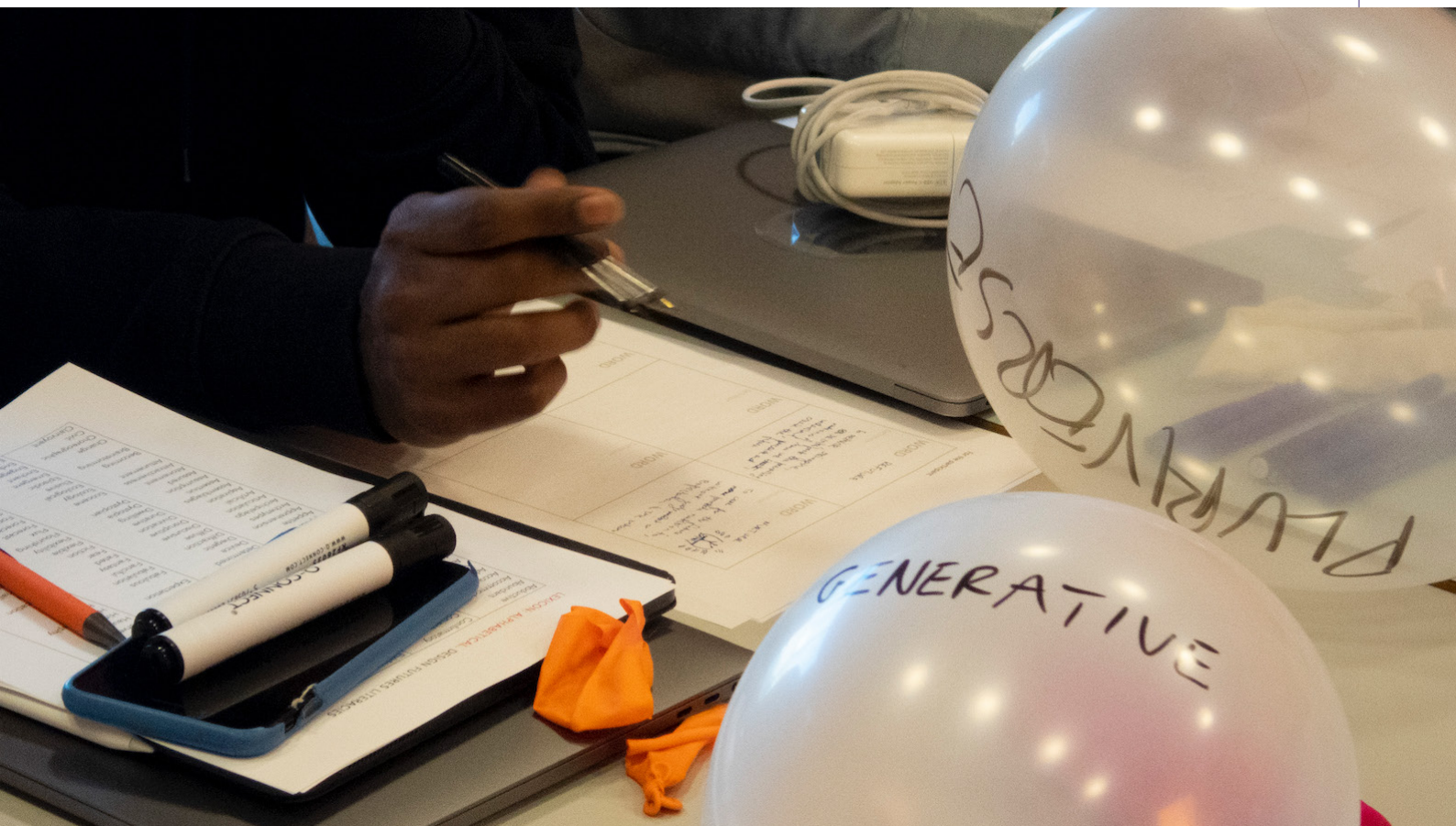
▲ Figure 4
A student in the PhD BALLUSION Workshop at AHO in 2019 pauses in writing his views on how to sort and apply terms from the DESIGN FUTURES LEXICON in regard to his own doctoral project inquiry. Time is both pluriversal and generative. (Image credit: Andrew Morrison).

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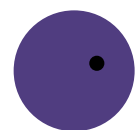
CARE, ENGAGEMENT AND DESIGN FUTURES KNOWING

BY Andrew Morrison & Karianne Rygh

WITH Palak Dudani, Guim Espelt Estopà, Jana Tothill, Roger Guilemany, Mariana Quintero, Manuela Celi, Bastien Kerspern, Jomy Joseph & Josina Vink

1. Introduction

BY Andrew Morrison & Karianne Rygh
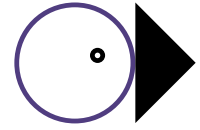
Some interlinked questions

Humility in pandemic times

In this chapter we address a number of interlinked questions concerning care, design learning and especially Service Design. The focus on the latter is on ongoing work relating to Public Health and shaping 'an ethics of anticipatory design care'. It is perhaps no surprise that we have taken this thematic given massive effects and deeply felt experiences and systemic issues arising as a result of the COVID-19 global pandemic.

In venturing into a discussion of still very tender and difficult topics, we are mindful of the words of Jasanoff in her recent book entitled Uncertainty. She suggests that we adopt a stance of humility in this time of crisis. In 'Humility in pandemic times', Jasanoff (2021. 10) proposes:

> *[Humility] occupies the nebulous zone between preparedness and precaution by asking a moral question: not what we can achieve with what we have, but how we should act given that we cannot know the full consequences of our actions. Thought of in this way, humility addresses the questions perennially raised by critics of precaution and refutes the charges of passivity. Confronted on many fronts by riddles too knotty to solve, must society choose either to do nothing or to move aggressively forward as if risks don't matter and resources are limitless? Decades of effort to protect human health and the environment suggest that the choice is not so stark or binary. There is a middle way, the way of humility, that permits steps to be taken here and now in order to forestall worst-case scenarios later.*

This concern with humility points to wider experiences and needs in the changing character and practices of Service Design as public health matters have been propelled into the public domain at a global level. Across the planet system-service relationships, policy-practice dynamics and political and ethical issues of care have demanded urgent and new thinking and action in working with Service Design and Public Health.

Given the pressures and needs that have become so patently visible at an enormous scale and Service design finds itself at a crucial juncture in its wider conceptual, content and pragmatic development. For these various, interlinked reasons, as part of the relational perspective we address in FUEL4DESIGN, this chapter focuses on this key domain in design education and application.

We have done this as part of ongoing educational and research engagement prior to the pandemic, which addresses the changing nature and dynamics of working with and rethinking relations between Service Design and Public Health (e.g. Jones, 2013). This is carried in the wider context of a marking out relations, problems and possibilities between global pandemic and care and design in crisis (Fry & Nocek, 2020). This we take up in terms of Design Futures Literacies where ethical, negotiative and experiential matters arise and continue to influence and be influenced by changing conditions and emergent needs.

The questions we discuss are:

> **What is it to learn to care and to take care ahead of time in designing towards public healthcare as well-being? How might Service Ecosystem Design be interpreted in the contexts of design futures pedagogies?**
>
> **How might we work to support learning towards understanding and practising Service design where negotiation with diverse actors with varying needs, in their intersections, emergence and temporalities?**
>
> **What might a notion of 'an anticipatory design connected care approach offer to shaping design futures literacies and practices?**

Negotiating and anticipating care and design futures

Referring to attachment via Winnicott's notion of 'protective holding', Groves (2014: 127) argues that 'Care is, in turn, an active form of 'holding' which agents who acknowledge their interdependence with objects of attachment exercise in relation to these objects – and which these objects, if they are caring subjects as well as objects of care, may exercise in return.' In *The Care Manifesto* The Care Collective (2020: 6ff) argue that the pandemic is just marker of wider, systemic carelessness as a consequence of neoliberal capitalist values and practices. This is evident in what they label careless worlds, care-washed markets, careless states, uncaring communities and careless kinships. In a countermove, their Manifesto is based on the core notion that care is about interdependencies. This resonates with a view on how a politics of care is central to the structuring of futures social relations, as Light and Akama (2014) argue in the context of Participatory Design.

The COVID-19 global pandemic, by way of a minute virus invisible to the human eye that has worked its way through globally airborne and tactile transmission, has repeatedly thrown into relief that earlier approaches to care cannot avoid engaging with human and non-human relations. It has also forced us into deep and at times contradictory relations with Public healthcare systems and policies. In this setting, the term 'care homes' took on a special, deeply tragic meaning in many wealthier societies as vast numbers of elderly residents lost their lives in settings of care, in care homes. Questions also arose as to questions of what care for whom, with marginal groups living in jeopardy, extending to millions of people in the Global South already living in poverty not having access to vaccines and their life protective capacities.

Manuagh and Twilley (2022: Kindle) trace histories of quarantine and paths to safety and public health and remind us that it is always negotiated and needs to be reframed as a process, as culturally reclaimed and as a personal responsibility to protect others. In their Epilogue, Manuagh and Twilley (2022: Kindle) write that 'In the end, it demands nothing more of us than that we take the appropriate space and time; that we simply pause, before venturing out again, until proven safe'.

While this is certainly true, the current pandemic has exposed massive weaknesses in the provision of care in public health, along with challenges for parents supporting their children's learning at home, and the work demands and costs for health professionals and support staff, teachers and students.

Care - and indeed care as understood in ways of connecting and realising effective, supportive and delicate Service Design in and for Public Health - needs to work in dialogue, in places, with participants (human and non-human), with politics and policy, heterogeneous practices of negotiation, adjustment and design. These tensions, challenges and very pressing real world experiences by health workers, the elderly and persons with critical health conditions - along with all of us in adjusting to a global pandemic and to teaching and learning within it and through and to some extent beyond it - have been exposed as implicated in governmental healthcare systems locally and nationally but also global inequalities in access to COVID-19 vaccines against a backdrop of conspiracy theories and behavioural denialism.

As Mullough et al. (2021) remind us, our goals is to work through design towards recovery and resilience. In a summary of their work, The Care Collective (2020: 76) asserts that:

> The Care Manifesto offers a queer–feminist–anti-racist–eco-socialist political vision of 'universal care'. Universal care means we are all jointly responsible for hands-on care work, as well as engaging with and caring about the flourishing of other people and the planet. It means reclaiming forms of genuinely collective and communal life, adopting alternatives to capitalist markets, and reversing the marketisation of care infrastructures. It also means restoring and radically deepening our welfare states, both centrally and locally.

Care has clearly become a key and global matter to do with public and personal behaviour and values. In this chapter we look into the notion and practices of care, and the powerful work done by feminist scholars and practitioners of care, including Service Design (see Romm & Vink, 2019).

In our view there is a major need for not only Service Design as a whole design education more widely to consider and take up key approaches beyond 'traditional' notions of care, ones me might say are often not foregrounded by placed in the background yet are fundamental to our futures in a changing world. Place (2022) refers to seven short examples to present a contemporary practice of design care, and includes a manifesto developed in collaboration with their colleague Marty Maxwell Lane (2022: 14):

The manifesto identifies many aspects of design education that are incompatible with humans' well-being, from attendance policies to toxic individualism, and priori-tizes values such as agency, access and reduced power hierarchies. The manifesto was developed as a collaborative project to invite diverse voices and perspectives, as the conversation on how to practise care in design education evolves ….

Presented only in diagrammatic form the key statements are: 'We will prioritise access; We will foster agency; We will care for ourselves so that we may care for others; We will hold space for what we do not know and what others have always known; We will promote a culture of care; We will employ empathy as a teaching tool; and We will interrogate and dismantle traditional hierarchies' (Plant, 2022: 14).

▲ **Figure 1**
Collaborative Documentation and Swarm Intelligence session, November 16, 2020, ELISAVA. The result was a collaborative map of projects, resources, news, etc., in the form of a design space that populates the students' physical working space and that can support the sharing of relevant information. A design space is a physical collection of experiments, reference objects, products, or materials that support the development of a design intervention as an action research exercise.. Master's in Design for Emergent Futures (ELISAVA, IAAC). (Image credit: ELISAVA).

There would appear, now more than ever, for such conditions and their contexts of operation and communication in care-ful approaches to Service Design and their own critical ecosystems. Vink et al. (2021) have conceptualised and studied 'A Multi-Level Process Model for Service EcosystemDesign'. This model is devised to offer 'a nuanced understanding of the complex processes that bring life to intentional, long-term change in service ecosystems' (Vink, et al., 2021: 176).

We see this model as providing a rich framing for further discussion of design futures literacies and Service Design in shaping the long-term and sustainable relations with public Health. We take it up below and attempt to connect it to given, emerging, challenging and changing aspects of design futures pedagogies specifically in Service Design. This is a domain of design that has received little coverage, educationally, of its own didactic, inter and transdisciplinary co-constructions. We offer some tentative reflections as to what might matter and how this might be made actionable through an extended notion of care.

At a systemic level, the denudation of bio-environments continues to increase the likely appearance and sweep of other non-human hosted pathogens. The provision and indeed safety of public healthcare systems and services, and human life itself are undeniably interconnected with the effects of human ecological resource consumption and destruction. Our students have been jettisoned into having to face and learn within, about and through deep matters of concern in the context of a health crisis connected to climate and environment; they have also needed to engage with learning that needs to be taken care of, personally, institutionally, and that needs to take matters of care as practice into its wider dynamics of designing for sustainable futures. This was evident for example in the DESIGN FUTURES SCOUTING work package in FUEL4DESIGN in which as a mode of care about self and sharing of 1st Person Perspectives were developed and communicated. These were part of a wider action learning and research mapping activity [Figure 1] and a student project on First Person Perspective [Figure 2].

Your future you

This activity intends to project the participants into a context where they are living in the future they are envisioning.

Prompt: Project yourself to the future you are envisioning in your project. Use your actual contexts and personal life to keep it close to you.

Video: Wongsathon Choonavan, Master in Design for Emergent Futures, 19/20

Wongsathon created an imaginary scenario where he didn't just enact his future self in his future ideal job but he played the role of everyone else that would be involved. The surreal scenario created allowed him to reflect on the future of jobs from all the possible angles he could enact.
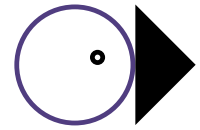
▲ **Figure 2**
'Your future you'. Example of student project in First Person Perspective (1PP) design interventions to create alternative presents. Video material shows care in anticipating and exploring plural roles. Master's in Design for Emergent Futures (ELISAVA, IAAC). I03 DESIGN FUTURES SCOUTING, (Image credit. ELISAVA). Link ↗.

2.
On Care

BY Andrew Morrison

An ethics of care

Attentiveness and responsibility

Studies of care have shifted their focus from gendered and domestic settings of care and caring to institutional ones (Held, 2006, Tronto, 20109. In the development of the related ethics of care approach, the often unseen and undervalued work of all contributors to care and caring has been acknowledged (see also Vaughan et al., 2020). This is extended to seeing care as central to all work, and that it is connected to situations and specifics of practice and it is entwined in relations and interdependencies. The changing notions of care in Public Health, with attention on home-based care and the development of related Service Design, have also focused on the everyday in care, caring, work and the experience of persons and organisations supporting and receiving care.

The work of Tronto has been central to the ongoing conceptualisation and practice of an ethics of care (Tronto, 1993, 2010, 2015, 221). Core to her thinking are the concepts attentiveness and responsibility; these are ones that in sense pervade this book. Where public care policies and the provision of care work through institutions, Tronto (2010: 162, original emphasis) argues that:

> *… to imagine a world organised to care well requires that we focus on three things: politics: recognition and debate/dialogue of relations of power within and outside the organisation of competitive and dominative power and agreement of common purpose; particularity and plurality: attention to human activities as particular and admitting of other possible ways of doing them and to diverse humans having diverse preferences about how needs might be met; and purposiveness: awareness and discussion of the ends and purposes of care.*

Tronto sees these aspects as offering us ways to inform and direct institutional thinking and their logics of care. The points of focus are an acknowledgement of the purpose of care as being political and in need of deconstruction and change in terms of power relations, the need for care to be tailored to individual needs, that is as particularity, and thus be approached as plural, along with a necessary space for the political elaboration of care institutionally. This contrasts with the family care practices as often being used to provide settings and criteria for what makes good care or market-led approaches and consumer satisfaction measurement.

Tronto (2010: 163-166) further outlines seven warning signs of bad care: 1) Misfortune causes the need for care; 2) Needs are taken as given within the organisation; 3) Care is considered a commodity, not a process; 4) Care receivers are excluded from making judgments because they lack expertise; 5) Care is narrowed to care giving, rather than understanding the full process of care, which includes attentiveness to needs and the allocation of responsibility; 6) Care givers see organisational requirements as hindrances to, rather than support for, care; and, 7) Care work is distributed along lines of class, caste, gender, race. For Tronto (2010: 166) there is a need to look to how such threats and assumptions to realising care may be balanced out and brought into productive recognition relations in their institutional settings. (See also Essay 3 Altering Prospective Design Pedagogies).

Following our broad approach in FUEL4DESIGN to develop anticipatory design futures literacies in a relational view (see Essay 1: Anticipatory Design Literacies), we see a service design ethics of care as being enacted through designing that reaches towards support for well-being (e.g. Meyer et al., 2020) that draws on relational framings (see also Nielsen & Bjerck, 2022). In our view this is also linked with how we see wider specificities and relationships and affective qualities and experiences (Jacob-Dazarola et al., 2020). In this regard, in a qualitative, situational methodological study of care work in the creative industries sector, Alacovska and Bissonnette (2021: 138) write that:

> *The ethics of care approach presupposes a relational interpersonal configuration of everyday life and work and thus necessitates a systematic understanding of the nature, quality and dynamics of relationships of care. In contrast with traditional ethical theories—including the moral economy approach—that privilege abstract principles, formal rules, impersonal duties and deliberative justice to sanction relational conduct, however, the ethics of care approach concentrates on the specificities of practices, virtues and feelings (kindness, empathy, compassion) as these arise from concrete life situations that are themselves infused in relational infrastructures and local webs of interdependencies (Gilligan 1982; Noddings 2010; Tronto 1993). Through this lens, care itself structures the practical, emotional and affective everydayness of human life (Archer 2000). Acting 'other-wise' instead of 'self-wise' thus becomes central to care-ful, reflexive living and working (Lynch 2007).*

The notion 'other-wise' highlights who's involved and with whom in mind, by whom care and futures are made, and for whom, not to forget who'll be experiencing and supporting care 'at home and in daily living, in and how-so. The notion 'other-wise' is taken up in the final chapter of this book.

Design work and the promise of the creative industries sector is taken up in a critical stance by Julier (2021). In essence, his view is that 'Work in creative sectors may return personal fulfilment, be project-focused, flexible and capital-light in character. Yet it is also professionally insecure and precarious while, at the same time, being subjected to extreme pressures of delivery and efficiency on the part of clients.' This highlights the delicate nature of attempting to work with care in design areas.

Alacovska and Bissonnette (2021: 138) further refer to the work of Lynch and point to 'Acting "other-wise" instead of "self-wise" thus becomes central to care-ful, reflexive living and working (Lynch 2007).' In Lynch's keeping with Tronto's concepts of attentiveness and responsibility, they go on to outline Lynch's work as being directed relationally, via a taxonomy with three main aspects, namely intimacy (typically parents and children), mutuality (such as colleagues, friends, relatives) and solidarity (public concerns, national cultures. environment)

We see these three as having considerable use for pursuing notions and practice of care in care-ful design and Service Design in Public Health where multiple actors and stakeholders with liked, different, overlapping and divergent views may all be involved in a single systemic or event-based care trajectory in the short, medium or long term, but also in unexpected, uncertain, emergent and ephemeral futures. This too is perhaps already something about and through which we've all become closely aware. Manzini (2015), claimed that everyone is a designer in how they shape their daily lives: the pandemic in a way made everyone a service design expert.

Care as design, design as care

In design education and research interest has been growing around the notion of care, influenced by developments in STS and ethics, studies of climate and environment, and in the growing domains of Service Design and healthcare. Care has been addressed within a diversity of design fields, such as in relation to products and the emergence of repair, recycling and reuse approaches (Ackerman, 2018). This points to the notion of care being included in work on sustainability, systems and environment directed toward planetary and multispecies care for survival (e.g. Wilde et al., 2022). Across and within design as making, inquiring, knowing and futuring Vaughan (2018a) offers a key set of contributions that engage with elaborating on design practices of care.

Rodgers, Bremner and Innella (2017) gathered a diversity of perspectives in a workshop around the core question 'Does Design Care…?' As one of its' participants, Dilnot (2017) was concerned with devising a design model or outline of care given that it is abstract yet performative, yet also intransitive, and part of translation of taking-into-account of another's needs that is itself also care (Dilnot, 2017: 2). He acknowledges that it is also about the perception of needs of another, of self and that it is delivered, entailing the quality of care as gesture, and always in relation to situations, contexts and moments. Vaughan (2018a) takes up perspectives and practices in *Designing Cultures of Care* and positions this work in a frame of 'Design as a practice of care' Vaughan (2018b). She sees this as:

> *… a conscious means of articulating an approach to design that is considered as sustainable and sustaining. This is not a call for design practice that is dull, unimaginative, or situated only in the realms of what is already known. Rather, it is far from it. Design as a practice of care understands that there is much more for design to contribute in collaboration with other disciplines and practice domains.*

In our own work on care, public health and Service Design, (Rygh & Morrison, 2022) we have positioned design as a practice of care as a relational practice that, following Vaughan (2018a), is situated in an ecology of care. We see this one in that considers all elements to encounters of care and its design and delivery, access and attainment. This includes products and services, that is things and to seeing care as realised through relations between human and non-human living beings, systems, ideas and practices. For us, such a view of care goes beyond 'matters of concern' (Latour, 2004) to 'matters of care' (Puig de Bellacasa, 2017) and extends 'mattering', posed by Haraway (2018), to that of care in practice (Mol, et al. 2010). The notion of care has been taken up in various domains of design, such as in focus on makerspaces, communities of makers and D.I.Y. collaboration and 3d printing (Toombs, 205; Toombs et al., 2015) in interaction design and health and well-being [→ SEE **FEATURE 1**].

Importantly, in all these developments and engagements in looking to better and different designing, learning and participation, as a mode of futuring, as Coxon and Bremner (2019) ask, 'Who cares?' Distinguishing between Common care (general sense, lower case 'care') and Complex Care (capitalised 'Care') and drawing on earlier work, Coxon and Bemner (2019: 2) developed a model of care centred on human beings that entwines three orbiting axes. These are: 'Experiencing (x); Living (y); Projecting (z); that are laced with Time … (t).' In their view, Care is shaped by everyday experience. It develops over time as consciously aware responses that impact on ourselves, on others (including objects) and on the world we each inhabit.' (Coxon & Bremner, 2019: 3).

From a feminist perspective, Davis and Paim (2021) ask 'Does design care?'. Their concern that care is just a new buzzword in design discourse and not part of systemic change despite care long being part of feminist politics and currently being challenged from decolonial perspectives. They characterise care as being commodified but also about being about the giving of consent, credit and compensation. Coxon & Bremner (2019: 5-6) conclude their piece on 'Who cares?' by challenging design and designers as follows:

The question, does design Care? must continue to be asked. If designers would like to help design a world where humans can Be together better, then design and designers must continue to ask itself and themselves…what does my Design of Care and my Care of Design look like? What form will My Caring Design take and how does it contribute to a caring world? How can my design help to turn Caring Design into what design wants (needs) it to Be? As design sifts through these questions on how to approach Care, we issue an obligatory warning: human beings have the ability to be both Caring and Careless, so the question of the role of Care in design is not so much who Cares, but how do I Care?

As design sifts through these questions on how to approach Care, we issue an obligatory warning: human beings have the ability to be both Caring and Careless, so the question of the role of Care in design is not so much who Cares, but how do I Care?

This focus on subjectivity, agency and responsibility also applies to individual, collective, institutional and collaborative orientation and activity. It also related to how we rethink, connect and work with feminist notions and practices of care around embodiment, health, well-being and care in developing sensitivities and dynamic relations between human and non-human entities and processes. This is evident, for example, in research through design project called 'Biomenstrual' (Campo Woytuk & Juul Sondergaard, 2022) that looks to multimodal means to developing menstrual care beyond the human body that may suggest ways to contribute to environmental and planetary well-being. In a related study, and drawing on Puig Bellacasa's focus on affective interdependence, Paez and Valtchanova (2022: 94) 'claim that a relevant politics of care (for fellow citizens, the global community and the more-than-human world) should not be limited to a social contract but should imply an everyday personal attitude, one that activates human agency as an axis for civic transformation. The body is a powerful way of exploring this agency'.

Designing of 'care-ful' and 'care-full' services

Given these matters and our experiences as persons, citizens, designers, learners, teachers, researchers and professionals living and working and making sense of a global pandemic, experience, knowing and opinions on care are now pervasive. Care, care work and care support and the designing of 'care-ful' and 'care-full' services have been deeply felt, championed and challenged as complex and important, but also unequally available and differentially distributed. This has been made patent concerning race, class and geographies.

In such contexts, and pre-pandemic, with our colleagues at AHO in the Connected Care (C3) project into Service Design and Public Health we have centred on a developing critical relational multi-logics of care, shifting from earlier market-driven logics of choice in service design innovation (Nilsson, Prakash & Vink: 2022: 5). This positioning aligns with perspectives offered by Mol (2008) and is an idealised integration of institutional logics with Mol's wider approaches and practices views on care (Mol et al. 2010; see also Lia et al., 2019).

Nilsson et al. (2022) elaborate on this in a schematic of relations, demarcated, respectively, as Market (Care as Choice), Professional (Care as Expertise), State (Care as Control), Community (Care as Social Connection), Family (Care as Unconditional Involvement) and Religion (Care as a Way of Life). Their overarching intention is to try to support awareness of relations of logics between Service Design in the context of Public Health by exposing hidden assumptions and values and to work towards 'preferred value co-creation forms' (Nilsson et al., 2022: 3). Naturally, this also has implication for design-based education and research and notions and practice of care, as our colleagues take up in research by design multi-method study of the processes and dynamics decentralisation of home-based care with a practice and framing focus on family care givers and the provision of equal healthcare services across cultures (Nilsson et al., 2022: 189).

Such attention to a plurality of practices and attention to more peripheral yet highly significant aspects of Public Health-Service Design relations may also be extended to understanding care between ethics and aesthetics. For Saito (2022: 219) 'care ethics' needs to shaped, cultivated, shared and practised. Such a care ethic is built through aesthetic sensibility, experience and expression as people relate to their settings and engagements, and to human and non-human entities.

Accordingly, 'In our interactions with the other, whether it be other people or objects, a successful experience results from focusing on their individual singularity and working collaboratively with open-minded receptivity and imaginative engagement.' (Saito, 2022: 219). This clearly resonates with attention to design futures imaginaries and design infused shaping of alternative pathways and futures in the present. For Groves (2014: 183):

> *… the care imaginary leads us towards a kind of future-oriented virtue consequentialism, in which the creation of particular relationships sustained by trans-subjective conditions and subjective virtues, as a bulwark against reflexive uncertainty, is the chief aim. In this way, we anticipate the care of future people by constructing jetties of solidarity out into the future through our care for constitutive values, solidarity that strains outward into the timescapes implicit within the things we care about, without ever necessarily being entirely equal to them.*

Overall, as outlined in the 'The Lancaster Care Charter' (Rodgers et al., 2019), care needs to be related to three conditions - complexity, the project at hand and relations. This they argue is so if care is to escape design's modernist tentacles and engage us as educators and learners alike in building design futures literacies that are performatively care-ful and ethically full-of-care. As Rodgers et al. (2019: 76) assert, 'An ecology of care is neither reactive nor solely scientific, but rather reflexive and proactive, founded on three conditions building on an open, developing and fluid set of approaches that celebrate relational agency, including person-centred, and posthuman models.'

For teachers and students of design interested in futures in design pedagogy, literacies and learning and in futures for design education, views such as these need to be considered also within what Held (2006) articulates as an ethic of care. This demands we situate design briefs, classes, collaborations, projects and theses in relation to values and practices where 'the ethics of care offers hope for rethinking in more fruitful ways how we ought to guide our lives.' (Held, 2006: 3).

As the teaching and learning about Service Design in and as part of Public Health during the pandemic, 'we' are designers and customers, teachers and students confined to our homes, and patients and carers. This throws us into working, living and learning within a 'multiplicity of logics in healthcare' (Nilsson et al., 2022) but also within a variety of types and scales and modes of realising care through the design and experience of services. This aligns with an approach to care articulated by Puig de Bellacasa (2011: 199) as 'thinking-with that resists the individualization of thinking'.

Design, care, Covid-19 and futures

In the context of Public Health and Service Design, Rygh & Morrison (2022: 78) argue addressing challenges of care is '… a complex task leading policy-makers, healthcare professionals, private companies and public organisations to have to think creatively and responsibly about how to anticipate future health contexts. This development calls for new strategies of shifting workloads and resources while still providing quality of care in healthcare services.' Facing such challenges, as argued elsewhere in this book, is also a matter of repositioning design education in terms of anticipatory design. This is a pressing need where the Covid-19 virus and health systemic responses have further exposed what Tronto (2013) calls a care deficit and further exhausted medical and care health professionals and led to serious situations of burnout and reduced quality of care (Haynes, 2021). Clearly, the COVID-19 virus and global, national, local, interpersonal and personal levels of response and adaptation have added immense pressures and needs to design's conceptual repertoires and to our educational responses as shifting from the notion of 'matters of care' as a proposition to think with' (Puig de la Bellacasa, 2011: 100) to ways design has worked creatively, critically and responsively in multiple ways.

Rodgers, Galdon and Bremner (2020a) have assembled and categorised immense and diverse documentation of design-based responses to the global pandemic and presented this as a matter of design care in historical terms. In a related research paper on design and the pandemic, part of a set published in the open access *Strategic Design Research Journal*, Rodgers, Galdon and Bremner (2020b: 324) observe that what we are witnessing is '… the revival of the practice of design – from the handmaiden of Capital to one of Care – which is expressed in a new critical attitude for looking at the design world, probing its practice, its theoretical position and its product.' They see this as offering a new model for design that is not simply chronological, even under the duress of engaging in research in the moment. In reflecting on the designing, designs, and their own work and analyses, Rodgers, Galdon and Bremner (2020b: 324) write that 'At this stage looking at designing with care through the lens of critical theory we can only draw temporary conclusions. Time will continuously revise this history. But from what we have seen we can also foresee some critical issues that will need careful thinking …' They elaborate on these as the following extracts illustrate:

> *'Designing with care concerns … how we react to the way in which the world appears to care for us.'*
>
> *'Designing with care is a new gesture for design.'*
>
> *'Designing with care, while we live in these strange and transitional times, is not necessarily transformational.'*
>
> *'… care is like conversation theory, which maintains that conversation is constituted by the listener not the speaker.'*
>
> *'… caring for design is not very visible. Caring for design is the responsible job of stewardship and only with care is the design for the future possible…after which, we will have to steward design to take care of it'. (Rodgers, Galdon & Bremner 2020b: 324).*

PoliMi PhD project

GROUP: 1

YEAR: 20220

TEACHER: Manuela Celi

STUDENTS: Ai Mengchao, Guo Ruixuan, Li Yimeng, Tong Xinyuan, Wang Desen, Xu Chang

TAGS: Healthcare. Care. Communication. Relationship.

Form of Pain / NENO

NENO are a set of three tools that help doctors understand better the patient's pain, it establishes a stronger doctor-patient relationship by making the feeling of pain more tangible and visible. It aids patients to seize their memory of pain and communicate it to the doctor, facilitating a precise diagnosis.
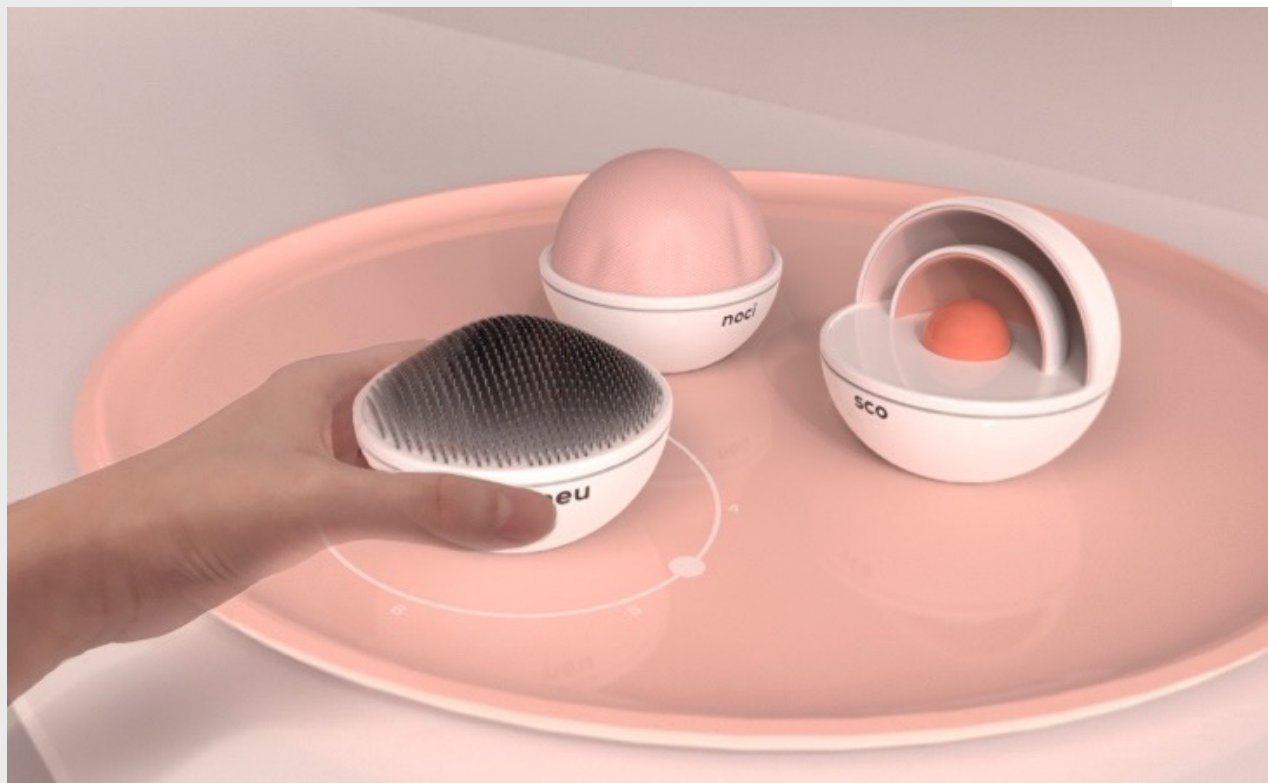
3.
An Anticipatory Design Perspective on Care

BY Andrew Morrison

Anticipatory service design for well-being

Relations of anticipation, care and systems

Our design-related public health and policy crises had perhaps already been ahead of us for more than a few years already; they became and remain compacted in merging, very challenging presents and thus pose immense pressure on developing sustainable long-term futures. Experience across the world has clearly shown that anticipatory service design for well-being more broadly is now central to our shared futures. This is manifest at local and global levels, spanning design technological vaccine development and delivery to long-lasting design contributions to more equitable public-private healthcare systemic relations and ethical rights and modes of access (see also: van der Bijl-Brouwer, 2022).

We see this as 'an anticipatory design perspective on care'. This is a view that needs considerable elaboration with our students and professional partners for it to be truly prospective, less reactive, more preparatory and medically and societally robust. Such 'taking care' depends on deep, core changes in how care is genuinely configured and delivered for long-term survivability and sustainably ethical futures and educational stewardship needs to be situated within a wider dialogical approach to interplays between public health and design. This is especially significant in the ongoing transformation of service design from its origins in marketing and management to matters of care that includes an anticipatory works of actors and support, extending to design and STEM partnerships and longer term public health preparedness as opposed to crisis management.

Taking care of plural futures

Our students need to access such stellar work itself and to learning how to work with and across transdisciplinary teams. They also need to go into processes of engaging with the complexities and potentials of what Osberg (2010) elaborated as a mode of 'taking care of the future' in which notions and practices of care are far more fully integrated into approaches to foresight, futures scenarios and their application and adaptation to immediate and near future needs and policies.

There is room for picking up what Ketley and Kettley (2017) present as a 'conceptualising radically careful design'; care and futures are inherently intertwined in what we see as a wider pedagogy of anticipatory design care yet this is rarely mentioned in research into

design pedagogy nor is a design pedagogical view much addressed in service design inquiry. However, this is only part of the ecology of care that needs attention.

As van der Bijl-Brouwer and Price (2021) argue, our design pedagogies have been challenged by the global pandemic to better take into account and account for the well-being of our students. To do so, they assert, demands we pay attention to our strategic human centred designing that is both systemic, especially in terms of staff and students personal and psychological needs, and adaptive, that is continuously seeking to realise student well-being through social innovation and experimentation in context.

One open-ended way we approached this in terms of crafting new vocabularies and potential performative discourses of future care in the DESIGN FUTURES LEXICON was to build resources around 'future-crafting' as our project colleague Betti Marenko has termed it [Figure 3]. The RENDERS section (Link ↗) provides a resource in the form of the downloadable FUTURES BRANCH CASTING KIT for further connection and application within what we see as an 'anticipatory design perspective on care'. Looking at related forces (economic, technological, social) as systemically connected still needs to be located and positioned critically within communicative, cultural and professional contexts through which values, actions, policies and transformations may be realised.

Figure 3 ▶
Working with adversarial approaches to shaping futures design and care with attention to vocabularies and world views, with resources in the RENDERS section of the DESIGN FUTURES LEXICON. (Image credit: Bastien Kerspern).

All in all, sharing by students and teachers in and through situated, sensitive designerly responses and creative making is at the heart of learning how to move forward together [FEATURE 2]. However, this may to easily fall into repeating or reinscribing positions and structural conditions that limit, or at worst, curtail, the pursuit and implementation of care for distributive, ethically supported well-being.

Example of Master's student work from IO3 DESIGIN FUTURES SCOUTING

BY *Oscar Tomico, Guim Espelt Estop, Jana Tothill, Roger Guilemany & Mariana Quintero*

PROJECT: OND

STUDENT: Anais Bouvet

COURSE: MDEF 2020-2021, ELISAVA & IAAC. Master's in Design for Emergent Futures

Ways of drifting in futures scouting

Anais Bouvet's interest laid in the intersection of biology, fashion, recyclable materials and self-care. From a very early stage, Bouvet used her interventions to form solid relationships with associations and companies in her vicinity working in these realms. Through fostering her connections with ConnectHort – a local urban orchard –, Collect Energy – an association collecting waste on the beach – and Ecoalf Foundation – related to Ecoalf clothing brand, focused on sustainable fashion, she began to form part of the fabric of Barcelona.

Through making and taking account of her 1PP, Bouvet managed to go beyond her speculative phase and live her desired present. Through her interventions, she managed to pave the way towards her alternative present by bringing about her personal concerns.

Within this first intervention, Bouvet undertook two activities while volunteering at ConnectHort: firstly, a soil analysis and secondly a series of seed bombs. Bouvet was interested in soil literacy which she investigated by analysing several soil samples (Figure 1).

The knowledge gained from the first activity allowed her to develop a second action, engaging more with other individuals: Bouvet proposed a collaborative development of seed bombs in order to create a community of knowledge interested in soil literacy, presenting here an alternative collaborative present.

Bouvet started volunteering to pick up waste from the beach as her second intervention, trying to understand the patterns of the trash that she was collecting (Figure 2). Her interests remained on the habits of the people that led to what she called 'detected patterns'. Bouvet was

▲ Figure 1: Anais Bovet's First intervention.
▼ Figure 2: Anais Bovet's Second intervention.

interested to know if the weather, the frequency and the seasons were directly affecting the type of trash she was picking up.

This volunteering work was interwoven with an internship at Ecoalf Foundation, which constituted her third intervention. While at the foundation, she got the chance to collaborate with fishermen from the Mediterranean to clean the sea and collect materials to make the clothing.

From the time spent collecting trash at the beach and working at Ecoalf, Bouvet observed how disconnected people were with their trash, feeling very little responsibility over it and conducted a series of interviews with beach users for her fourth intervention.

The interviews were divided into two themes, all under the umbrella of trash: waste at the beach and waste at home. In the exchange, people were also informed about different or potential uses trash could have. This experience became the foundation of her final intervention: 'Full Face' (Figure 3).

_OND is a health and beauty brand fomenting self-care, empowering users to create their face-masks from safe-home generated organic waste and providing the knowledge to develop future-friendly masks at home. For these, an inclusive all-gender multi-masking mould and started prototyping with gel-based masks was designed.

_OND's 'Full Face' project (Figure 4) and final master's intervention is based on a concept of personalisation and accessibility of home self-care linked to DIY communities and experimentation with new biomaterials and offers recipes using natural ingredients from your kitchen and everyday recipes. It is a project that also draws on current fashions trends to fuel a long-term vision for a collaborative and environmentally friendly future. By empowering the users to do it themselves, they reached out to a wider audience, making their desired present tangible.

Bouvent's modes of scouting within her research framework alludes to an expansive way of 'growth' (Figure 5). Her testing nature of trying things out as they appear allowed her to explore new areas of interest and expand her learnings, from intersecting areas and previous actions. Bouvet's final intervention started taking form as new experiments were conducted and new knowledge appeared. This process led her to propose an alternative present that materialised into a wellness platform.

▲ Figure 3: Anais Bouvet's '_OND full face' final intervention.

▶ Figure 4: Anais Bouvet's '_OND full-face' drawings for the final intervention.

▶ Figure 5: Anais Bouvet's expansive drifting in Futures Scouting representation.

Anais Bouvet's master's repository: **Link** ↗

Foundation Ecoalf: **Link** ↗

Bouvet's interventions were conducted in tandem with her classmate Bothania Rafaa A Alamri, under the name of _OND.
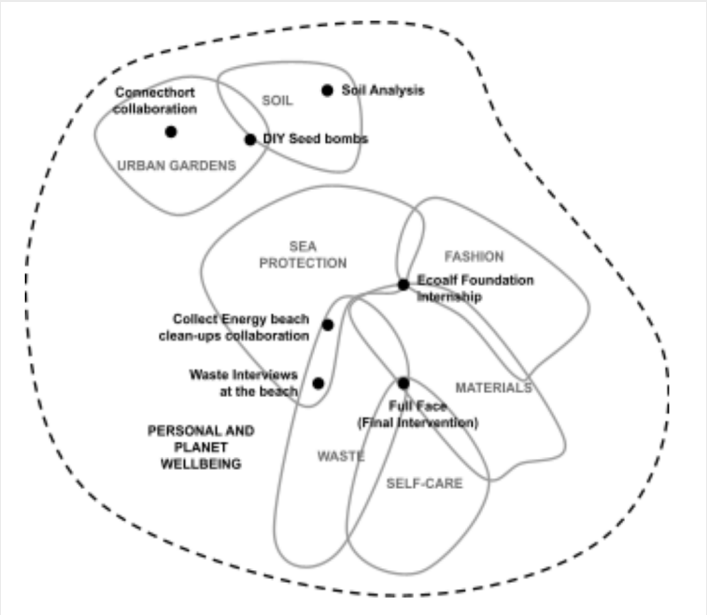
4.
Care, Anticipation, Learning and Service Ecosystems Design

BY Karianne Rygh
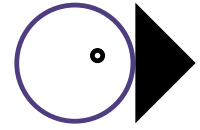
Learning anticipatory 'care-full' service design

Pedagogy, care, design

For students of Service Design and Public Health, but extending to other domains of design with and for and as care, these warning signs entered into their own daily lives and the impact of institutional care from both the health and educational sectors. Accordingly, care is in our view today a key component in rethinking our notions and practices of design pedagogies where relations between care and futures need to be approached in an expanded view. This expanded view entails systems and geopolitical aspects of climate and environmental change, or resource use and re-use and of supply and consumption logics and patterns and the logics that drive them.

For students of design, attention to services has grown immensely in the past decade in intricate if sometimes seemingly flat relations between use and users, systems and surfaces, interactions and consumption. Attention to care and relation to service design and health and well-being [FEATURE 3] is now a common, globally shared experience, varying in location but undeniably a challenging and ongoing part of their emerging arrival in a world of design under duress and a global and national landscape of institutional responses and effects.

Anticipating 'Connected Care Services'

In the past few years humankind has gone through the intense challenges and experiences of the Covid-19 global pandemic. Our experiences of it across the world have exposed vast differences and stark inequalities concerning healthcare provision. Service Design, already the newcomer to design disciplinary demarcations, has been forced to reconsider and reconfigure its assumptions, policies and practices.

Working on a PhD in Service Design in which my own lived experience has shifted during the pandemic from student and researcher to patient and parent, has challenged my own appreciation and understanding of relations between service design and public health. These shifts and experiences, which have taken place in Norway and the Netherlands, have led me to question how we can better anticipate both near and far-future contexts of healthcare, how we can design services that are more easily adaptable to new and constantly changing circumstances in meeting the needs of very different patients in the most vulnerable of situations.

Furthermore, what aspects of such service designing needs more attention, consideration and care to offer more variety in what is offered to patients within the same service, according to individual social and situational differences. As the experience of health caring is often so deeply personal and individual, what aspects of our bodily senses could we draw upon as designers to better anticipate the needs and experiences of others in need of care.

Below, I offer a number of propositions and recommendations that I have been developing in my doctoral research [→ SEE **FEATURES 3 and 4**]. They have been drawn from close personal experience, via reference to emergent research literature and through dialogue with a diversity of colleagues, friends, family and researchers.

All in all, I see them as part of the reconfiguration of my own notions and practices of anticipatory designing in which short and longer term futures are in sore need of futures directed discussion in ongoing dialogues, strategies and actions between Public Health and Service Design.

'The Multi-level Process Model of Service Ecosystem Design'

Four propositions

'The Multi-level Process Model of Service Ecosystem Design' presented by Vink et al. (2021) contains four propositions that are highly suited to development and analysis of Tangible Tools and Tangible Service Design as part of the ongoing futures of seeing services as haptic and embodied (Rygh & Morrison, 2022).

These propositions may also be activated as devices to help us rethink the relations of shaping deeper multi-level processes, feedback loops in the pedagogical realisations and materialisations of Service Ecosystem Design.

We outline four propositions briefly below (Vink, et al., 2021: 174-178) with a short gloss as regards diverse relations to possible, imaginary and unlikely challenges to devising what we term *Anticipatory Service Design* responses. This we then follow up with a discussion on their multi-level process relations.

The propositions we have arrived at are as follows:

1. On Co-Creation. Proposition 1: Due to the emergent and phenomenological nature of the desired forms of value co-creation, the outcomes of service ecosystem design are never fully controllable or predictable.

We suggest that an Anticipatory Service Design will shift focus from managing processes to rather connecting and supporting relations between participating actors so that room and flexibility within design processes can be provided enabling the inclusion of potential or unexpected collaborators and contributions at different points in time.

2. About Materials. Proposition 2: Service ecosystem design occurs through the shaping of physical enactments and also the inseparable, invisible institutional arrangements enabling and constraining value co-creation.

We suggest that an Anticipatory Service Design will contribute means and techniques for visualizing or making tactile that which may be too intangible or complex to grasp so that invisible arrangements can be understood and anchored so that they can be acknowledged, discussed and addressed.

3. Concerning the Institutional. Proposition 3: Since actors are involved in ongoing institutional reproduction, intentional shaping of institutional arrangements is only possible through an embedded feed-back loop of reflexivity and reformation.

We suggest that an Anticipatory Service Design will provide time and room for 'reflexion' and iteration by bringing involved parties into contact with one another at different points in time through, for example, visualised elements of institutional arrangements so that these can be reviewed, adjusted and adapted iteratively.

4, Matters of Actor Involvement. Proposition 4: Service ecosystem design is a collective endeavour by multiple actor constellations influenced by ongoing interactions within and between both conflicting and aligned design and non-design processes.

We suggest that an Anticipatory Service Design will be attentive to and value interpersonal actor relations and see the establishment, support and nurturing of these relations as a fundament for value co-creation and exchange of expertise, as well as learning between actors via exchanges of expertise, experiences, opinions and critical views.

Let's reconsider the multi-level aspects of the 'The Multi-level Process Model of Service Ecosystem Design' (Vink, et al. 2021). The micro level entails reflexivity and reformation in the form of an embedded feedback loop located within institutional constraints and practices enabling actors to take part in co-creative, purposive and emergent forms and values. One can see the potential in terms of tangible tools and tangible services for this focus to be extended to include further focus on materialities and artifact development in which co-creation and intentionality are prevalent and positioned as part of not only a multi-levels but also a multiple material development of tangible tools.

However, in such an ecosystem view, institutional systemic factors and forces prevail and may be in need of alteration at a meso-level through which negotiation by diverse stakeholders to service centric public health co-design may take place, including those from outside design, thereby pointing to attention being needed to aligning and conflicting views from within and without.

These meso-level matters are addressed in the case above concerning the role and nuanced unfolding of collaboration and reduction of competition for resources and hierarchies of potential and actual conflict between disciplinary specialisations.

This takes us to a meta and institutional level, often beset by slow change processes, where the service designer and related tangible materials, as well as the service designer's individual or team presence in workshop and decision-making sessions may also contribute to realignments.

As Vink et al. (2021: 177) note in a discussion of clinical teams discussion, the ways interplays are materialised via tangible tools and related embodied engagement may lead to reinforcement of co-design choices or even their overlapping interests or emergent differences being rephrased or more forcefully reiterated.

Working through futures-oriented design dynamics

Such reiterations may serve to highlight, blur or divert the overall focal design processes of the service ecosystem – and its futures options and pathways, where potential and preferences may need a measure of flexibility and spaces being made available for re-designing in flux. This may have major implications for the further processes of futures-oriented design dynamics and a diversity of modes of affective living, working and learning [→ SEE **FEATURES 5 & 6**]. It has import then too for longer-term sustainability and re-negotiation of features and experiences in emergence and being impacted by changes and unknown events, outcomes and medical treatments and programmes that are themselves experimental and reaching onwards to generate new knowledge and its effective application.

An Anticipatory Service Design cannot succeed unless we train students to work with such a multi-level approach that is futures facing while being creative and critical. This needs to be collaborative and coherent in processing its tensions and potentials as they unfold. Such processes and activities need to be repositioned and negotiated to reduce uncertainty yet remain open to reaching beyond the constraints of the given and naturalised every day. This is important when over time they turn out to be more limiting than known, and less available for adjustment or succession.

Needed then is an ongoing awareness and agility in working reflexively (Vink et al., 2021) with tensions and situations (given and emerging, hidden and obscured), and with participating stakeholders in dynamic and abductive shared pursuits and practices in reaching to continue to secure and support 'care-full' prospects.

PhD Case: Toward A Service Design Ecosystem of Connected Care

BY Karianne Rygh

PHD WORKING TITLE: Exploring Care-Based Tangible Service Design – Supporting relations of Connected Care through the Design of Tangible Tools

SUPERVISOR: Prof Andrew Morrison (AHO)

Tangible tools

Working with the changing character and practices of Service Design has been central to my doctoral work what I have come to call Tangible Tools (TT) in the context of service design and public health. These are ones in which, in the context of a wider funded national level centre for innovation project called Connected Care, are designed to anticipate alternate scenarios, strategies and directions in shaping relations between service designing and the conceptualisation, provision and delivery of Public Health (PH).

Here I focus on one key aspect of my design futures learning, as a product to service design professionals and designer-researcher with professional research experience in Norway and the Netherlands. In research through design mode, my work has explored the early phase and situated development and use of Tangible Tools in support of intra-professional team negotiation around resource allocation and

sharing in the shaping of a new centre for cancer care. My work has extended to both designing of tools and mediated action conceptualised as articulations, that is connected activities and amplifying notions of care through shaping relations between physical tools, touch, gesture and spatially enacted embodied negotiations. Overall, I've come through taking care to look ahead of time and of immediate delivery thinking a wider complex of design ecological care. Following Vink et al. (2021), one of the main challenges in design that supports the connection of services in the provision of public health is for such design to be positioned and enacted within what we have termed 'A Service Design Ecosystem of Connected Care' (Rygh & Morrison, 2021).

In my work on Service Design Tangible Tools development and contextual heuristic implementation, I've anticipated and contributed to 'the co-creation of long-term care based decisions in which multiple interests needed to be considered and reconfigured in rethinking disciplinary/domain boundaries, tensions and potential intersections and overlaps of needs, wants, visions and preferred and potential futures in PH.' (Rygh & Morrison, 2021: 107).

Anticipating 'Connected Care Services'

In the past few years humankind has gone through the intense challenges and experiences of the Covid-19 global pandemic. Our experiences of it across the world have exposed vast differences and stark inequalities concerning healthcare provision. Service Design, already the newcomer to design's disciplinary demarcations, has been forced to reconsider and reconfigure its assumptions, policies and practices.

I envisage that possible and potential links and application between tangibility and services in SD need to be considered as a whole in TSD. To do this, we have proposed that the connections between tangibility and services for what is yet to be decided and materialised, in the near future and for long-term care work, may be achieved by linking the following:

1) values and artefacts, 2) the choice of materials, 3) form and appeal, 4) relations between sensory modes and mediation, 4) design and representation, 5) embedded and tangible affordances, and 6) metaphors in support of enactments.' (Rygh & Morrison, 2021: 107).

▲ Figure 1: Example of a Service Design engagement using the Tangible Tool 'Allocator' for negotiating the reallocation of hospital beds, patients and connected care professionals and resources in establishing a new hospital cancer ward. The new cancer ward would be a first step towards a planned, future Cancer Centre, centralising care for cancer patients regardless of cancer type. (Image: Karianne Rygh).

In FUEL4DESIGN I've been fortunate to be able to observe, make and discuss care as a transversal thematic and design futures pathway making process for investigating SD and PH. There is much more to be done concerning the ongoing and prospective translation of care centred ecologies and systemic approaches to changing service design (Vink et al., 2021). In terms of pedagogical-professional linkages, in my work I have learned just how delicate negotiations and processes of shared meaning making are in supporting 'A Service Design Ecosystem of Connected Care'. As a designer learning to become a designer-researcher, I see that:

... underlying psychological aspects that create hesitation and resistance to service development processes are in need of further research in continuing to build SD contributions to connected care in PH through embodied perception, mediated action and dynamic interaction by participants and stakeholders to durative support and change. (Rygh & Morrison, 2022: 108).

Anticipatory Aspects of Service Design Futures

BY Karianne Rygh

Reshaping service design futures, public health & care

1. Collaboration and care

In order to anticipate future health contexts, policy-makers, healthcare professionals, private companies and public organisations have to collaborate creatively and responsibly in developing services that meet the growing care deficit facing our public healthcare system.

2. Connecting care

Such collaborations can be seen through the development of Connected Care Services, cross-sector healthcare partnerships that aim to develop digital services, alleviating healthcare staff while simultaneously empowering citizens to take more control over their own health. Such healthcare initiatives are often mandated by policy to meet financial and resource needs. However, such endeavours don't always work out as well as projected.

Different professional traditions, working cultures and practices hinder healthcare-related professionals from being able to collaborate effectively, develop new approaches and discover new opportunities as they are not always compatible. Such mandated collectives of experts have a need to negotiate a common point of departure/understanding for the task at hand that connects them in the co-design process they will need to engage in.

3. Innovating Connected Care services

These therefore requires a relational view where attention is paid to the connections, the in-betweens – which services, technologies, expertise, systems, organisations and people ought to be brought together and in which way they should be configured and how/if they are able to function/work together (across disciplines, sectors, organisations, cultures and practices).

It is through these connections that interpersonal healthcare relations are built and incorporated into new services and it is

through these relations that quality in care can be manifested and felt by end users/patients.

4. Building care from within
Such configurations of resources and relations need to be negotiated and built from within. They rely on the expertise and lived experience of those involved first-hand, requiring SD approaches that are not forced upon healthcare professionals, but rather co-developed in order to find appropriate means with which to support and encourage healthcare professionals to discuss and negotiate the necessary conditions for collaborative relations of care to thrive.

This requires SD approaches that make the more intangible aspects of healthcare service design graspable (visible, possible to point to and discuss), so that these can be better understood, communicated and negotiated with relevant actors.

Reconceptualising care, design and services

1. The development of Tangible Service Design
A 'careful' Service Design approach to investigating emergent contexts through exploratory heuristic methods and participative activities with and by diverse stakeholders, creating the conditions for Service Design and Public Health expertise to intersect and foster innovative healthcare service relations.

2. Conceptual understanding/development of Tangible Tools
Three-dimensional, mediating artefacts designed to facilitate multimodal communication and interaction via situated actions afforded by an artefact's designed physical attributes, representational and social semiotic properties.

3. A Model of Careful Tangible Engagements
Considering what type of engagement is most appropriate for the topic at hand and the specific experts participating. Evaluating what material dimension of tools could create the necessary conditions to support a given engagement and enable experts to materialise complex topics, making them graspable and possible to discuss and debate.

4. Careful Tangible Engagements
The co-development and co-design of appropriate formats for engagements with relevant experts, that suits the topic at hand, the specific participants, the location and project timing to create supportive conditions for negotiating contested topics.

The often complex, intangible topics to be explored are made graspable through the co-design of appropriate Tangible Tools where the tools' material and aesthetic dimension invite discussion through taking on new meanings through metaphorical use - in their felt, spatio-temporal dimension by the arrangements, placements and visualisations created by participants.

The design of the engagement and the design of the tools fuel one another in an iterative process of designing both the experiential and material dimensions of the engagement, where the process of determining the context-specific design specifications uncovers rich contextual data/knowledge of the invisible relational structures of a collective of experts.

Questions for design, futures and connected care?

I see Careful Tangible Engagment as central to shaping relations between design and futures and frames and practices of connected care:

1. It questions notions of care and how care ought to be conceptualised within the development of new healthcare services in order to bring quality to care and to serve Primary Care Services and overall Public Health.

2. It brings attention and discussion to what Service Design support diverse actors may need in the early phases of service development due to the complexity of cross-sector healthcare partnerships.

3. It questions traditional interventionist and emergent disruptive approaches within Service Design practice as such approaches have shown to work less favourably in early phases service development in healthcare contexts.

4. It draws focus to the ways in which the interplay between materialities and interactions can help us better understand the complexity within relations of care and how relations of care can be acknowledged, supported and fostered within healthcare service development through tangible enactments and why it is that such enactments work so well.

5. It adds more focus to discussion on what role design can play in the development of Service Design methods and tools in the areas of values and artefacts, material choice, form and appeal, relations between sensory modes and mediation, design and representation and embedded and tangible affordances and metaphors in support of more body based enactments. It questions how the aesthetic dimension of Tangible Tools influence how complex topics can be perceived and experienced and what meanings such designed objects can take on when they are put into play in a designed tangible engagement by experts with knowledge/experience on the subject.

6. It questions what skills and competencies can be built within design students to be better equipped to meet future complex contexts, exploring how formally trained design skills within product, graphic and interaction design can be more actively incorporated into Service Design approaches and methods to enable more bodily engagement in Service Design activities and why/how this may be beneficial in a healthcare context.

7. It furthers links between service design and interaction design and the ways in which these can be brought together through the design of Tangible Tools.

PoliMi PhD project

GROUP: 2

YEAR: 2020

TEACHER: Manuela Celi

STUDENTS: Benjamin Di Gioia, Ana María Gonzalez, Eva Monestier, Macarena Saravia, Sofía Wiener, Asaad Zein

TAGS: Therapy. Care. Self-empowerment. Mental health.

Aura

Current times are calling for an always on lifestyle that demands our constant participation in social activities and perform at our best. Aura is an earbud device that allows the user to self-treat anxiety through specific rhythmical beats, calming the user.

Unpacking some tensions in anticipatory service design, pedagogy and futures

BY Karianne Rygh, Josina Vink & Andrew Morrison

Assoc. Prof. Josina Vink is the leader of the Connected Care project at AHO (**Link** ↗) and teaches service design at the Master's levels and supervises design doctorates in service and systems design. In their design pedagogy, they are working to catalyse critical reflections on the logics that underpin service and systemic design and the associated methods. Through their teaching, Josina has been employing embodied, practice-based learning activities with community partners that explore alternative futures, particularly in the space of health and care. The wider reach of their work can be followed further on ResearchGate (**Link** ↗).

Following discussion with Josina on public health, service design and connected care, we posed a short set of question to Josina ask them for more situated responses to work done and underway as well as anticipatory design care in service design and public health.

Andrew: Josina, could you describe briefly your own futures-oriented design pedagogy and its changing contexts on services and care in recent years?

Josina: My pedagogical approach aims to be community-based, action-oriented, dialogic, critical and focused on making the world otherwise. In my courses, we collaborate closely with local partners, including hospitals, municipalities, companies and community organisations. While embedded in the local context, we learn together with our partners and conduct design experiments around shifting the current conditions for care. Oscillating between action and collective dialogue, we critically reflect on the existing conditions and the consequences of taking care otherwise.

Karianne: I wonder how might we and do we enact creative critical shifts, as you have been doing, from earlier approaches to Service Design so as to expand and position these in alternate configurations and SD futures?

Josina: Its tricky. At the Master's level, many students come in with clear understandings of service design as a traditional, linear, step-by-step approach to build solutions through new service development. Sometimes students feel disoriented working toward more critical and anticipatory aims that do not directly satisfy the initial and immediate wants of partners, but rather open up the possibilities for

alternative futures. Making this shift often takes spending time in critical dialogue about the unintended consequences of using traditional service design methods and the implications of designing in a vacuum based on the overarching logic of the day.

After this, there is more hunger for exploring alternative more imaginative approaches to service design, that challenge what is help, people explore other possibilities. One example of how this manifested was in the enactment and analysis of experiential future service scenarios that explored the consequences of future mental health services that are based on different logics.

Andrew: For you, what concepts, frames and publications have been central to working with an extended and connected notion of care in Service Design and public health?

Josina: One of the recent books that have been shaping my thinking is Health Communism (2022) by Beatrice Adler-Bolton and Artie Vierkant. It presents one of the clearest critiques I have read around the ways that the concept of health has been individualised and commodified by capitalism. It encourages readers to fundamentally reject this notion of health and move toward a radical vision for health communism that ensures all care for all people. I have also been greatly influenced by the work of Patricia Hill Collins in Black Feminist Thought (2000/2009) on enacting more liberatory models of care that resist racialised and gendered notions of care enshrined by slavery. I have also been greatly inspired by the incredible work being done by people with disabilities to reimagine care relations from being a burden toward being something that is mutually beneficial,

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such as through the practice of 'care webs' (Lakshmi Piepzna-Samarasinha, 2018).
Andrew: Could you please elaborate a little on how you see design futures literacies as relating to SD and PH care and futures? How might this be understood inter/generationally as we work with ongoing intakes of young design students?

Josina: For me, the question of design futures literacies rests on the importance of reflexivity – an awareness of the social structures guiding our thoughts and actions. In order to be able to shape care futures and explore alternative possibilities to the present day, we need to make visible the invisible structures of the system. I think this can take on different forms, but this is my main pedagogic goal when working with my students and community partners. In my most recent course, we work to make these structures tangible to open them up for renegotiation through a discursive dinner with the theme 'Mental Health Care Games' in which participants engaged with games that reflected the structures of the present-day services to support discussion about the implication of these structures and possible alternative rules of the game.

Karianne: How do you see the way forward via an approach to what we have called 'anticipatory design care' for our teaching? For partnerships? For PhD research?

Josina: For me, recognising the crisis of care that we are in, in both in the short and long term, demands a more critical and radical orientation for care design. We cannot continue to be 'servant designers' within the current political and economic frameworks of care that got us here.
This demands the cultivation of humility, but also boldness in our teaching, partnerships and research. We have to learn care-ful ways of challenging the status quo of the existing

service systems together as well as seeding and amplifying hopeful alternatives in the present day.

Andrew: I wonder if you could give us a short outline of some of the ways you have been applying care-ful approaches in your own teaching and courses in Service Design. FUEL4DESIGN may focus at master's and doctoral student levels, but please feel free to mention other aspects of your work across the design curriculum.

Josina: We have been experimenting with care-ful approaches in class including by exploring building in supports for our own mental health into our processes of designing mental health services. We have also been discussing the ways in which design can reproduce harm in the service design process, despite good intentions, and how we need to actively mitigate those harms. KA McKercher's podcast episode on Practicing Without a License on This is HCD is a great resource (**Link** ↗) along with (Hirsch, 2020). I am also always working to support safer, anti-oppressive spaces in the classroom by recognising and addressing oppressive structures in our project work and in our learning together.

Karianne: Thanks for taking time Josina to reflect on care and to connect it in ways that take effort and insight. These conversations matter to my own learning in working with Service Design and Public Health as well as to shaping my understanding of care which has been impacted by meeting care and the health systems and services in Norway and the Netherlands through the course of the pandemic.

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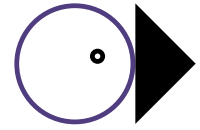
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5.
Making Further (Future) Connections

BY Andrew Morrison & Karianne Rygh

From Capabilities to Pluralities of Connected Care

Human-centred, creative Service design

Yu (2020) has proposed an integrative service design framework to assist researchers in reflecting over the nature and contribution, to support the positioning of their work in the wider context of multidisciplinary Service Design and to provide a means to co-develop multidisciplinary perspectives on Service Design. We align with Yu's view of Service Design as a 'Designerly approach to creating service experience and building organisational capability' where he defines a designerly approach as 'a designer's way of thinking and practising for framing and solving problems in a human-centred and creative way (…) grounded in the academic discipline of design'.

Adding to this view of SD, we depart from Holmlid and Evenssons's definition of Service Design (2008) as 'the systematic application of design methods and principles to the design of services'. Instead, we include Moritz' view of Service Design as a 'new holistic, multi-disciplinary, integrative field' (Moritz, 2005) where 'Service Design helps to innovate (create new) or improve (existing) services to make them more useful, usable, desirable for clients and efficient as well as effective for organisations'. Yet Service design and Public health in terms of a plural view on futures raises issues about tensions that design might instil in its work in public health that may limit what-if thinking, and thereby what might become.

As Rodgers, Galdon & Bremner (2020b: 324) conclude, as design professionals, educators, learners, teachers and researchers, 'We are inevitably careless and we need to be careful about our carelessness. No matter how careful we might be, all design thought and action has consequences which raises a number of dilemmas and paradoxes that underpin the positionality of what-might-not-become'.

From the What-if to the What-when

In the context of Service design and Public Health, amplified in the COVID-19 pandemic to a global level, teaching and learning design futures literacies demands we take care seriously as we reach to work from the what-if to the what-when. Care and time relations have been revealed to be even more important in shaping the designing and delivery of services, support and needed revision to existing public healthcare and well-

being. We see a need to pursue design pedagogies in futures shaping in which care is positioned as relational, reciprocal and empathic, futures facing and reaching. In doing so, and in actively developing and following a notion of 'connected care' as thinking ahead of time, strategically and dynamically, asks that we think and work systemically but also understand a diversity of cultures of care today, but also in our futuring and futures. For our design undergraduates, as well as for our master's and doctoral students, the design, delivery and support of healthcare via public services require give-and-take relationships in the development of services and in the practice of their unfolding, adjustment and adaptable long-term provision.

One of the key challenges for us as educators to convey to students is building and maintaining coherence in shaping the practice of connected care. Students of Service Design and designers learning to research Service Design and Public Health need to know not only how to approach, understand and support relations for different experts and organisations, but how to connect these in seemingly seamless ways so that services may be easily identified accessed, followed, revisited and retrieved. The negotiation through design of such coherence, via coordination, collaboration and building coherence is itself in our view from of situated and performative care. However, our students also need to understand - as do we as educators, and medical professionals alike -that design futures care also needs to be centred on the individual. Attention needs to be directed to personal experience of a service and preventative, clinical, curative and palliative care options and pathways to best possible scenarios is theirs, and may differ from that of others.

Equally, generic and typical systemic provisions of care must be ensured for these scalings and tailorings to be enacted. As advanced medicine in wealthy countries shifts to both increased home-based care, entailing technologically mediated configurations, relations of carers, of A.I. care systems and tools need to be on our students critical creative radar and readiness to rethink both given and promoted futures. This is especially significant where the interests and financial models of massive medical corporations and sorely stretched Public Health systems are themselves impacted by wider corporate constructions and delivery of options to the realisation of equitable means and sustainable practices for healthiness and well-being.

Then too, there is a need for design students and teachers to become aware of and be exposed to how medical systems, decision-making and the apportionment of a diversity of resources are arranged and allocated. This is especially the case when challenged at their fundaments such as our students and intergenerational experiences have revealed to us all in these recent years globally and across and within different nation states and regions. We need to appreciate yet work pragmatically with real situations where opinions and world views on care differ between fields of expertise, such as views on quality of life and specialisations, including people in healthcare from outside healthcare. This too is difficult when different expertise is mixed; it is not only such mixing that is challenging and to the realisation of design-centred development of sustainable healthcare futures, but the negotiation and connection of how care may be provided over and in time.

Large, multi-disciplinary cross sector partnerships in many instances are positive as they do work to committing many resources towards shared and specific goals that may be reached differently, depending on need and pathways of selected care. Especially in recent years, students and design educators have undeniably been exposed to such changing landscapes of care, personally and institutionally. In a multi-national co-authored paper unpacking higher education located relations between equity, inequality and COVID-19 in the context of a pivot to emergency remote teaching and learning (ERTL), Czerniewicz et al. (2020: 964) observe that:

> The nexus of these transformational issues requires a new way of seeing and not unseeing what needs to remain visible. This is where the hope lies. The pandemic has been an MRI exposing the social bones (Roy 2020), an X-ray making it possible 'to see all the broken places' (Wright 2020). Thus, our reflections of ERTL in this paper illuminate multiple and coexisting forms of inequality in higher education. While this might seem hopeless at times, recognising care as repair embraces the notion that 'when people [and indeed systems] confront their failures, they have the opportunity to mend them' (Wright 2020). Clear analysis of the complex shape of the terrain is essential, as is resistance. Harder to grow, yet fundamental, are the seeds of community, collaboration and commitment which can restore and recreate a deeply damaged sector.

Heeding such promise and caution, we are reminded of the writings of Bozalek et al. (2018) and their framing of 'a pedagogy of response-ability' and the need to make connections between the personal, political and global (Held, 2006) in a designerly shaping of an ethic of connected care. Needed are clearer bonds - analytically, creatively and pedagogically - between Systems Oriented Design and Service Design so that multiple and interconnected layers and dynamics may contribute to nurturing the 'seeds of community, collaboration and commitment', and beyond the European design school at the core of the FUEL4DESIGN project into seeing an anticipatory design care ethics at a global view in changing design in higher education as not only repair but also re-junvenation, aspiration and anticipatory motivational action in the present.

Learning care-full design futures

Our experience in recent years, professionally and personally, has been that our Service Design students most likely will continue to enter into challenging, complex and changing contexts of how healthcare is being scripted and enacted.

Our students will need to have anticipatory service oriented literacies to be able to assist others in seeing and negotiating entwined, apparently contradictory yet also potentially complementary systems oriented designing in the shaping of services that are not only robust, durable but also scalable, for example, in the replacement of an app. They will need to be able to help themselves and wider teams of experts with whom they work in shifting knowledge exchanges in managing tensions and their balances as well as offering alternative scenarios and pathways for Service Design in support of known and unknown unknowns. These will need to address more than playful futures playbooks

and gravitate towards actual designs in systemic processes of transformative depth that reduce the distance between provotypes and full delivery, yet remain speculatively imaginative and realistically deliverable.

If for a moment, consider new treatments of cancer. We currently do not know what reactions and after affects they may produce or lead to in longer term patient futures. Further, health professionals have to anticipate how to care for patients at later stages of treatment, recovery or loss, where what may be needed or what other experts might see to be needed may even relate to different parts of a patient's body. An *Anticipatory Service Design* may not follow the same trajectories or experimental scientific logics of cancer or other research and healthcare provision.

In such contexts there is room for design school curricula to engage in Anticipatory Service Design for Public Health, and partnerships between public and private health sectors, for they are not static, but relationally care-ful in acts of designing that are informed by medical expertise and models while offering situated and systemic responses and innovations in how not just delivery but lived experiential services are met and engage with by people for whom healthcare systems ought to deliver equity and access that is clinical, ethical and social.
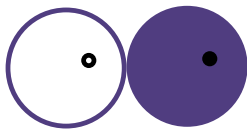
6.
Expanding an Anticipatory Ethics of Design Care

BY Andrew Morrison
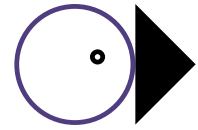
Enduring concepts

We see that Tronto's framing of an ethics of care is still pertinent today and offers some scaffolding or engaging further with how design schools may critically and continuously engage with design as a practice of care (Vaughan, 2018b). Tronto (1993) demarcates four broad elements as central to an ethics of care: attentiveness, responsibility, competence, and responsiveness. These she sees as stages, dispositions and goals. Attentiveness refers to an orientation towards becoming aware of needs. Responsibility concerns being motivated and open to responding to needs. Competence address skills and practices of delivering appropriate and effective care. Responsiveness has to do with positioning the interests and needs of others in their views along with sensitivity to abuse in care settings.

◀ **Figure 4**
Silke Lange (left) and Pras Gunasekera (right) facilitating Hacking Futures – Futures Hacking Workshop with postgraduate students from across UAL, 7 February 2020 (Image Credits James Bryant).

While remaining broad, we do see that these categories apply some almost 40 years since their publication and apply in the wider context of learning to care in democratic contexts (Tronto, 2015) and shaping designer citizens of the future (Costandius et al., 2018), these are the people who will in their work and research draw on foundations of socially just pedagogies we have enacted though their studies and that offer them means to realise anticipatory designs responsibly (Bazalek et al., 2018) in the world for

long-term sustainable futures. There are perhaps further links here to be made and be remade to the earlier discussion of care, moral education and globalisation by Noddings (2010). This might include three key means to nurturing care - dialogue, practice and confirmation - that Noddings (2011: 201) discussed in relation to a school-centred education in which 'One to meet the other in caring'. An example of this can be seen in a reflection blog post on a workshop on 'Hacking Futures' (Link ↗); [Figure 4].

Toward an ethics and practice of anticipatory design care

In the context of our work on Service Design and care, in learning together as doctoral student and advisor, and through processes of reflection on designing for tangible care as a professional designer and as a researcher of design futures in an anticipatory view, through our dialogues in the past five years we have arrived at what we see as six additional elements in a situated, dynamic and engaging ethics of anticipatory care.

These are 1) Relationality, 2) Anticipation, 3) Temporality, 4) Continuity, 5) Emergence and 6) Buffering. These we also identify and locate with changing pedagogies in higher education, including design schools, and they may be referred to Service design specifically but also more widely in an anticipatory design pedagogy.

Relationality refers to a design futures care pedagogy that is realised and secured through the making of connections between a diversity of actors and systems, need and experiences. Anticipaton is central to a pedagogical ethics of care in its stance and action of taking care ahead of time, prospectively and critically, with the aim of returning these to shaping options and paths for exploring alternate presents and action today [→ SEE FEATURE 7].

A pedagogical future ethics of design care is one that takes heed of the roles and forms in temporally shaping our creative and critically inflected imaginaries and their affective aspects as we negotiate relations between past, present and future. In working to actively shape futures by design and through our processes and practices of making and responding to change, continuity is a key principle of care for participants and uses, designers and educators because it binds together users, services and interactions where technical and market-led change may interrupt or disrupt connected care delivery and support.

However, there is a danger that in doing so marginalised, unseen and underrepresented groups may be sidelined or unrecognised. Julier (2017: 177) suggests that 'Making the material and informational infrastructures, the systems of power or the financial logics of economies of design visible and knowable might also be one of the tasks of design practice itself.' Such a view in part asks that we look closely at who and whom are involved and how so in shaping and ensuring equitable care, services and their enactment [→ SEE FEATURE 8].

In a wider view of the global pandemic, this has become hugely important. Poorer nations have struggled to not only work within already compromised public healthcare systems, ones that are entangled in their historical, colonial and own political legacies

Working with reflexivity and anticipatory design

BY Bastien Kerspern

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DESIGN FUTURES LEXICON

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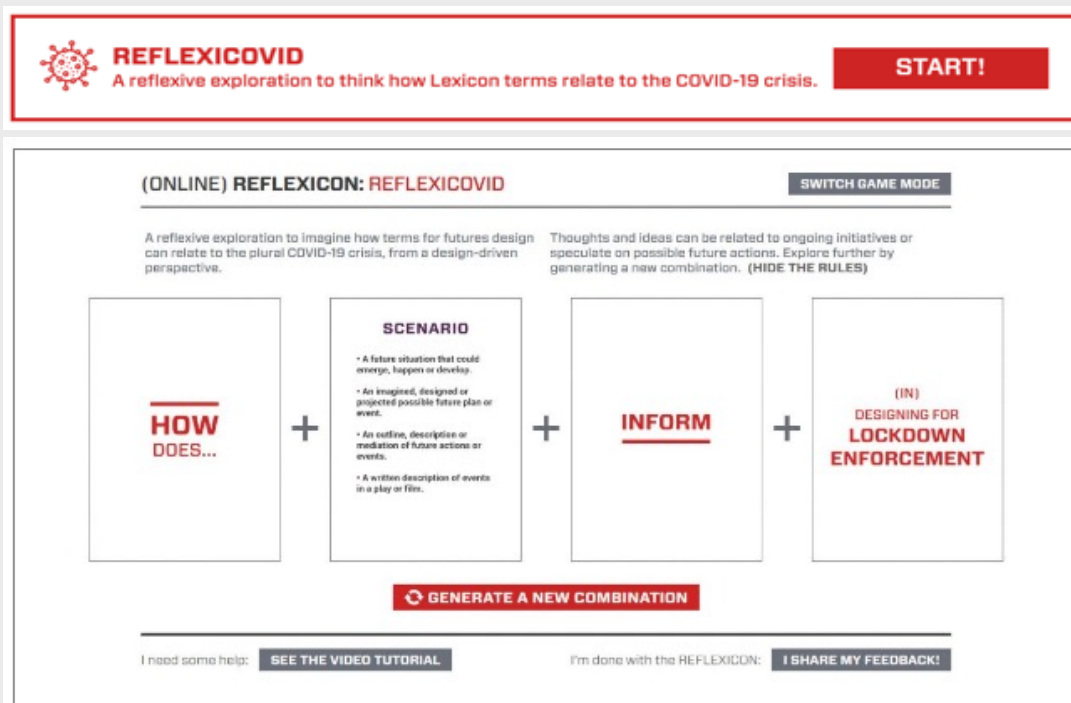
REFLEXICOVID builds on the reflexive posture of the game to invite designers to think about how DESIGN FUTURES words can relate to the Covid-19 plural crisis. Indeed, what is one of the major disruptions of the 21st century is not only a public health crisis, but also economic and social ones.

REFLEXICOVID is a reflexive exploration, in the light of FUTURES DESIGN terms, to (re)think what are designers' roles, postures and actions and during the Covid-19 crisis and building post- Covid-19 perspectives. It questions how FUTURES DESIGN and DESIGN FUTURES LITERACIES can be linked or disconnected to Covid-19 challenges and shocks: lockdown, social distancing, invisible workers, improvised healthcare solutions.

As a reflexive tool, REFLEXICOVID doesn't provide any answer or solution. Instead, it seeks to help designers in standing back and then deciding what they can do, should do or avoid to do in these uncertain times.

PoliMi PhD project

GROUP: 1

YEAR: 2020

TEACHER: Manuela Celi

STUDENTS: Farida Agzamova, Shangyi Bai, Federico Fanucchi, Nicole Pinardi, Rebecca Squeri, Qin Wei.

TAGS: Parenting. Control. Relations. Care.

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This product works as a breastfeeding prosthetic used to transmit certain signals that will stimulate the baby while being fed. The parent may pass on memories and thoughts to their children through the connected electrode, creating a strong bond. The device may be used by male parents with the proper milk container, while remaining the basic electrode and magnet connection with female mothers.
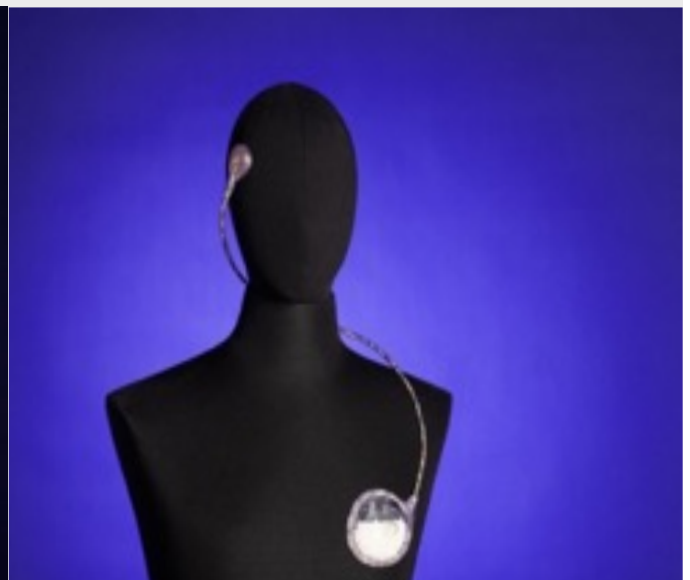
and contexts. Vast sums have been allocated to the rollout of COVID-19 vaccines in the Global North, and have also been met with disinformation and conspiracy theories fanned by social media and the global spread of viral fake-thinking, one might argue. Yet, many citizens of the Global South and their ministries of health and related NGOs, despite support from the UN, could not access such vaccines not only due to infrastructural issues but due to systemic lockdowns of public healthcare ethics in a first profit, second well-being. The more we have thought about this as designers, educators and researchers the more we cannot disconnect such a phenomenon from wider global systemic inequality and the violence of continued fossil fuel logics and material extraction for wasteful, environmentally damaging and short-sighted futures (see also Essay 2: Sustainability, systems and learning design futures).

As education project, FUEL4DESIGN has argued in various ways and from a range of views that we supporting learning for more than the immediate or instant gratification and the consumption of resources without ecological forethought. We've taken up scenarios as one response to a futures mode of opening out possible directions redirected back into the present and then back out beyond it [→ SEE FEATURE 8 on REFLEXICOVID]. In posing 'what-if' modes of making and inquiry in speculative design, criticisms arise as how they may be brought actively and productive back to the present. What would it take to shift the political economic logics of not removing patents on vaccines that can limit the sweep and devastation of a pandemic virus?

A future scenario, and perhaps even a near future event, might be envisaged in which patent holders in the Global South would not make their new vaccine freely available to the Global North (on grounds of a previous pandemic not acknowledging the health, moral and ethical needs of 'people before profit').

This is not one we would promulgate. Yet, this reverse and limited logic reveals the significance of the need to engage further in design anticipatory terms with wider global futures views - that is already playing out in ongoing political-economic and geostrategic practices, policies and events, for example in countries in the Global South not aligning themselves with mega-powers, or doing so with Russia and China. The experience of governments, citizens and Public Healthcare institutions and professionals, whose different roles and experience are still for example part of and disputes in the U.K. about remuneration for health workers, is all too often not discussed and researched in design as regards matters of systemic design and political economies in global design education. Just as the Global Financial Crisis of 2008 challenged the foundations of management and marketing logics behind early Service Design but the political economies behind neoliberal values of service and design received limited discussion (see e.g. Julier, 2017).

Pause a minute. Take a FUTURE PHILOSOPHICAL PILL. Beware it may be toxic, perhaps it may heal you. Whose pills, and who is offering them and who has the options, security and money to access them? Who is distributing these pharmacologies? Do remember the danger of swallowing false facts! A design futured ethics of care will necessarily need to respond to and engage productively with change and uncertainty and so it will need

to heed the nature and effects of emergence in is design processes and encounters in ongoing processes of dynamic socio-technical and environmental ecological transformation. Given such a mix of interconnected aspects in a design anticipatory ethics of care, needed also is a buffering of space and energies for design students and teachers to be able to pause and take stock of the conditions and developments in their work and the world. This too is about holding such spaces open to finding new options and pathways through openness to what has transpired and to that which may not yet be experienced or understood, collectively and personally.

Reaching for 'response-ability and responsibility'

Let's return to the six elements of an ethics of anticipatory design pedagogical care we identified. Taken together these six elements are embedded in activities of maintaining and repairing, as Tronto covers, as well as being exercised through acts of hopeful, critical and creative exploration and performative experimentation. In the context of ecological, geo-political and socio-technical change, in which design meets crises and needs to reach beyond their immediate dynamics to understand and pose and prepare alternative pathways in conjunction with other fields of expertise and collaborative shaping of futures, connecting care ethics is essential. This is a matter of linking and distinguishing relations between humans and non-humans, between emergent and promoted technological futures and more equitable and democratic societal systems.

Accordingly, anticipatory design care must engage actively and critically with political care ethics (Bozalek, et al., 2021). This needs far more critical elaboration in design schools and where professional design needs to renegotiate and unlearn its own practices and contributions to political economies lodged in unbridled consumption and extractivist logics and lobbying through which care of the environment and care of our human futures are not merely threatened but are part of a collective suicidal drive towards ensuring and upending democratic and caring and care-full presents and futures. In terms of design education, including Service Design, we might heed the call by Tronto (2021) to draw on and develop feminist new materialist views and care ethics in how we work with care in reconfiguring higher education. This she suggests is to engage with and through 'response-ability and responsibility' and we see these as paths and potentials for developing alternate futures though designing otherwise.
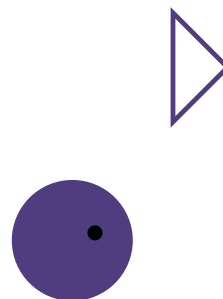
7.
Widening Anticipatory Care, Design and Futures

BY Andrew Morrison & Karianne Rygh
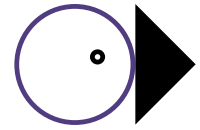
Towards long-term futures

Getting the right things right

Aligning a diversity of needs, with patient ones at the core in Service Design, will be central to futures service literacies through designing. The conceptualisation and practice of an anticipatory critical and connected care through praxis will need a shift away from managing to negotiating. It will need to delve into gaps and opportunities and what can be designed to bridge support and to make most of the opportunities that must be faced and reframed for long-term sustainable approaches to 'care-ful' and connected health systems. These aspects matter for wider continuity and value-security in ensuring improved and sustainable well-being for long-term futures.

Rodgers et al. (2002) argue that Design needs to work in undisciplinary ways; Edeholt and Joseph (2022) urge us to return to situated disciplinary expertise in an approach to 're-futuring' that goes beyond 'de-futuring' (Fry, 2020). In his related doctoral work Joseph (2023: 150) argues that '... working towards rehumanizing design is also grasping what traditions genuinely need to be cared for, remembered, refused, reclaimed, reimagined, and reinvented.' This is profoundly about holding and nurturing care and utopian imaginaries as key where 'It remains unknown what design might do or become if it could rectify these wrongs and begin to do the "right-things-right." Therefore, working towards rehumanizing design is also grasping what traditions genuinely need to be cared for, remembered, refused, reclaimed, reimagined, and reinvented.' (Joseph, 2022: 150).

In Feature 9 the material presented from this recent doctoral thesis that also helps position notions and practices of care as transitional, a matter of 're-futuring' and needing to design social imaginaries to shift beyond given to possible outcomes and meaningful, ethical and agentive care-full long-term differences [→ SEE **FEATURE 9**].

Towards co-caring futures design learning

For us, 'care-full' Anticipatory Designing must aim for long-term futures where a multiplicity of needs, practices and timescapes and timescales are understood relationally and pragmatically. It needs to ensure the interests of young persons in their own extended temporal and experiential futures at the same time as supporting others. In Public Health, with the expansion of home-based care, it is imperative that care should be both inter- and a-generational and distributed in terms of need, such as on

disability and mental health. Generic care in an anticipatory and systemic sense ought not to be so overarching as to deflect and dilute specific and dedicated needs that must be secured to prevent marginalisation of lived daily lives and the futures values and lives. It is important, further still, that we remember care can be enacted for older adults, whom as Wilson et al. (2022) argue, may be involved in co-creating and co-caring around futures of care. Here Anticipatory Service Design pedagogies need to look at the arcs and trajectories of needs and modes of living and flourishing as can be best supported and secured.

Young design students need to be able to look beyond their own immediate and near future perception of need, care and change to work with futures scenarios that pose tensions, offer pathways and perhaps even provoke options of unexpected care-full transformation. This may make our education designs of classes and their event and action-based learning approaches less convergent in the service journeys we conceptualise, try out and explore. This ought to continue to be developed, heuristically and in situationally, with diverse stakeholders and critically active participants who together may be included in co-designing some of the care-full futures they may need to live through, endure and even contest.

Following on from Duan et al. (2021), Prakash (2022) argues that cultural plurality can and ought to play an important role in shaping service designing through self-critical reflection and wider related practices. She draws on the work of Akama et al. (2013) in arguing for the situating of such services in relation to communities with diverse cultural values. Just as care and well-being need to be connected, Prakash (2022: 2) reveals ways we may better surface and secure needs that may be obscured or marginalised in wider practices of care and hopefully avoid the continued 'risk of propagating harmful structures…'.

Public Health systems and Service Design offerings are under considerable challenge from market forces and in terms of funding. They continue to intersect and even contribute to massive and changing demands on staff and the well-being of health professionals and patients. With home-based care being rolled out, as Prakash reveals, we need to look care-fully and closely at what is being designed and build plural futures that include '… what and how designers need to critically self-reflect in relation to cultural plurality in their practices'. (Prakash: 2022. 15). This points to an ongoing need to work to realise plural perspectives in anticipatory design care and in ways to further explore and position futures views and methods in shaping anticipatory relations between care, Service Design and Public Health for well-being.
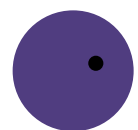
Refuturing Studies: Rehumanizing futures through/by design

BY Jomy Joseph

SUPERVISORS: Prof. Håkan Edeholt (AHO) & Prof. Bodhisattva Chattopadhyay (University of Oslo)

EXCERPT FROM: PhD thesis, Jomy Joseph (2023: 119-121).
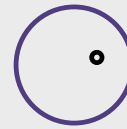
In my thesis work I propose and outline '… a transitional theory of ReFuturing—to "refuture" that which has been defutured; by reclaiming, reimagining, rethinking, and rehumanizing the dehumanized and defutured present (P1), such that the future is profoundly different when we arrive in it (P2).' (Joseph, 2022: 112).

Emergent Technologies of Care

In a world of P2, having undergone such radical societal transformations, diffusion of essential freedoms, and its celebration in public life, one can also imagine a different kind of technological creativity emerging in paradigm P2, seen in its artifacts and technologies. Thus, when institutions of care design technology, it is in the service of care for Nature, Society, Body, and Mind. In this case, the technologies of domination are transformed and rehumanised to care by regenerating the planetary biosphere for high-quality public infrastructures that fulfil essential social needs for care and leisure. These technological shifts are tacit in the diegetic artifacts from the design fiction and as fabricated here and now, possibly making these futures imaginable, sense-able, and do-able today. I would call these 'Technologies of Care,' which I have also alluded to elsewhere (Joseph, 2021 in appendix).

These Technologies of Care are emergent since they are generated by using existing scientific papers and studies from paradigm P1 and speculating them for radically different purposes beyond what their authors may have intended informing their diegetic technological developments within paradigm P2. This speculative reading of the technical papers grounding these technologies are both old and new, some high-tech, some low-tech, either labour-saving, labour-caring, even labour-intensive but labour owned, some based on modern science, and others based on indigenous knowledge systems and practices. This practice creatively generates and critically grounds the scaffold of the conceptual wormhole between the diegetic worlds of P1 and P2.
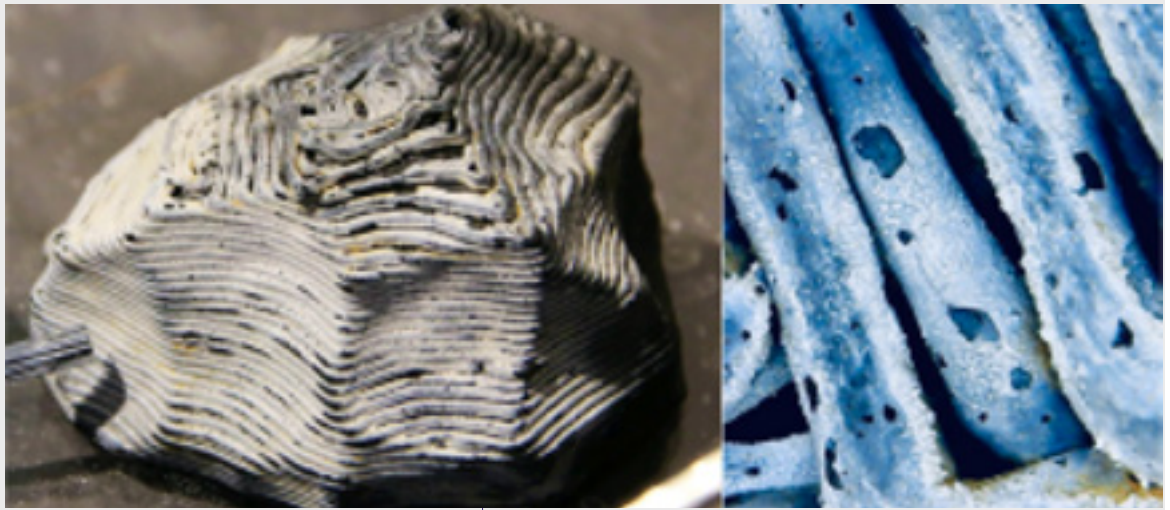
Some of these technologies are 'low-hanging' fruits and can be seen in some diegetic 'experiments' inspired by these speculative interpretations (Figure 1). These technologies are imagined for social and ecological abundance, emissions reduction, and carbon capture, changing some of the fundamental operating mechanisms for technology. In fact, contrary to the culture of critique, what the journal illustrates is that solutions do have a place as the right tools for the right job, and many, if not all are feasible today if one reimagines how they are produced.

Therefore in describing P2, the journal also discusses perspectives on how these technologies in a new climate reparations paradigm are produced and cared for strategically while also de-commodified and decoupled from emissions and ecological harm. These technologies and goods are imagined to be locally produced, distributed, and consumed for fulfilling essential needs. These fabrication programs are scaled-out rather than scaled-up, federated

industrial institutions for Socially Useful Production manufacturing essential technological goods that fulfil essential needs through ecologically regenerative practices. If essential large-scale production is ever necessary, it is meant to be in limited batches and might even be 'slow' or 'seasonally' fabricated for high-quality technologies, but like all essential infrastructures designed to be climate resilient and to last generations, reducing cumulative mass consumption.

Moreover, technological proliferation unfolds rather quickly under these seemingly restrictive conditions. Thanks to their open knowledge provisions of the climate reparations programs, open technology transfer legislations open alternative pathways for adopting climate-resilient infrastructures. Integrated with transforming, reusing, repairing, and upcycling existing technological infrastructures now powered by carbon-negative energy and materials ecology, there is a sharp decline in emissions and ecological impacts of these systems.

8.
Closing

BY Andrew Morrison & Karianne Rygh

Design care practices and relational, interpersonal and affective values

Care and collective (design) ethics

Pujadas (2022: 32) writes that, drawing on the three core tenets of care - care is relational, contextual and anti-essentialist – advanced by Tronto (2012), a designer should work towards democratic and inclusive criteria. She argues that:

> *This would result in design that would accept that human beings, other beings and the environment are interdependent, that would assume that human diversity requires detailed attention to existential situations and to listening. It is design that would move away from authoritative and dogmatic positions to claim a democratic attitude that would give voice, act as a testimony and narrate others.*

In looking back together, as teachers and students, from the view of courses and curricula, from Service Design and Public Health, and in terms of 'pandemic pedagogies' and 'returns to a new normal', exploring and supporting and changing design futures in education has been a deeply existential experience. It is infused in many ways with individual and collective ethics, yet these in our view remain to be further discussed institutionally as Tronto began to advise as far back as 1993.

The COVID-19 global pandemic has forced us and engaged us at so many levels in understanding and critiquing the legacies and practices and futures of Public Health and well-being. It has propelled us to reconsider the role of Service Design in shaping and ensuring their more equitable and genuine realisations not only as regards health and healthcare.

Design schools – from wider infrastructures of curricula to individual student prototype, for example – are engaged in working from the inside, that is through our situated and hopefully care-ful and caring practices of teaching and learning together. In our view, there is still much rich experience and insight to glean from Service Design courses and related research project that weathered the pandemic and are being reconfigured and re-appointed to navigate and negotiate deeper systemic issues and relations between service and public health.

Perhaps there is more to be gained in mapping these actions and systems views in ways the design innovative responses to the global pandemic were charted by Rodgers, Galdon and Bremner (2020a).

Might such a mapping also extend as part of our design futures pedagogies of care to futures views in and through such mapping to work towards relational and reflexive placement and practices.

Might such a mapping also be carried out by students as part of an experimental and care-situated anticipatory design pedagogy that emphasised agency and the building of self-critical and system-reflexive understanding of relations between care, environment, institutions and infrastructuring.

Might this be posed and patterned as one that is plural and perhaps angular in its surfacing of tensions and relations and less in a drive to provide seamless services, but support students to understand that through their futures learning now they will be anticipating and later enacting force and frameworks that influence and effect long-term well-being, ecologically, systemically and personally and societally.

In this regard, reflecting on their study of creative industries sectors workers, Alacovska and Bissonnette (2021: 148) offer a useful view on contextualising an ethics of care:

> *In emphasizing relationships of care, we have demonstrated the need to contextualize creative work in practice within its local and situated setting. Only in this way can we hope to understand how creative work is both constrained by and enabled by community affectivities, mutuality and solidarity. By practising an ethics of care ourselves as researchers (Spicer et al. 2009), we recognise affirmatively our informants' local perspectives, responsibilities, affectivities and practices of care. Against this backdrop it is possible to reconceptualise the policy, educational and organisational aspects of creative work 'from the inside', i.e. from the emic perspective of care—or of what actually matters to creative workers.*

These creative workers are in design schools and they move from them into other professional contexts. Alacovska and Bissonnette (2022: 48) further observe that:

> *The ethics of care perspective, with its focus on hands-on caring practices and situated acts of compassion, offers a novel and reinvigorating tool for understanding the pluralistic reasons for engagement in creative work, providing multi-faceted criteria for evaluating the relational, interpersonal and affective values operative in professional work.*

The futures of care in design education, and especially in Service Design - from the development to experience of services and the roles of service designing in supporting well-being for all - must surely be a key part of how design futuring contributes to more equitable, joyful and productive persons and societies.

However, as Murphy (2015) writes in 'Unsettling care' in relation to feminist care perspective and technoscience cast in overbearing tropes of happiness and wellness, 'What, then, is the work of discomfort, unease, and trouble in matters of care?'

In reply Murphy hopes:

> ...to introduce into the conversation the following: (1) the urgencies of transnational, postcolonial, and anti-racist analytics, for which to unsettle is a disruption to non-innocent narratives of belonging and a challenge to gestures of rescue, sympathy, and occupation that too often recapitulate colonial legacies, and (2) the work of disturbing and setting into motion sedimented arrangements of valuation and devaluation.

For Murphy (2015: 732):

> Unsettling requires analysis that is in solidarity with the thick and hard-won analytics created by women and queer people of color, as well as anti-racist and decolonial feminisms. Beyond a simple politics of dismantling, unsettling is a politics of reckoning with a world already violated: it is a commitment to desedimenting relationships that set the political, economic, and geopolitical conditions of knowledge-making, world-making, forgetting, and world destruction. Unsettling does not promise good affect; it is against, as much as within, the alignments and orientations that stratify technoscience. Moreover, when affect is constructed as the pivot of a political or recuperative project, and when technoscience is invited to choreograph belonging and pleasure, or to assemble intimacy and rescue, this is a moment to remember critical tools and entangled pasts.

These propositions and their reckonings point to the importance of working with unpacking how care is framed and enacted and for and by whom.

Positioning 'futures-design care'

Futures care discourses now pervade the many publications on climate and the Anthropocene. Yet seldom do we see fuller discussion of framings of care or the wider and long-term work with care achieved by feminist scholars.

Deep systemic issues between services and care in Public Health since stricter periods of lockdown in the pandemic have resulted in highly troubling resistance to monetary and work practice support for health professionals and workers in many countries.

Contradictions between organisational and financial models, including global structures and interests and ones of personal needs, and the needs of minority and poorer communities and countries, has been so very clearly exposed.

The pandemic jettisoned a fast feared future into the present. Yet alternate futures are hard to realise when, for example, in the abundance of the U.K. large numbers of people die in ambulances queued outside hospitals. Groves (2014: 182-183) reminds us that:

It is self-contradictory to care for particular constitutive values and not to care for future worlds, because all care for such values connects us to the concentric circles of conditions of care, including narratives and ideals, and to their internal, defining timescapes. The future is not just populated by the singular futures of what we care about, a narrative that unites self and others against a horizon of common fate. It is also populated by the futures of the supporting conditions on which the constitutive values cared for by ourselves and others ultimately depend.

Design as a profession and design education and research will have to engage with very real tensions between 'a mode of making more' that is advanced as progress to 'making do with less' more wisely. Attention to the relation between Service Design and well-being therefore becomes key.

Well-being is not an ephemeral experience, but rather long lasting, Cássia Garcia Silveria et al. assert (2020). The authors state that assuming that well-being can be achieved merely by providing services that meet users' needs, promotes a far too simplistic understanding of well-being, demonstrating that the relation and link between Service Design and well-being is still underexplored.

'Making do with less' requires a deeper understanding of what constitutes well-being, being attuned to a particular subjective experience and gaining and understanding of what really matters in a particular moment of care.

In building an understanding of well-being, service designers in Public Health can find themselves in health contexts where they may need to support participants in emotionally difficult situations requiring relations of trust, empathy, sensitivity requiring careful approaches that they as designers may not necessarily have been taught.

This will need to continue to be addressed in and as a design futures literacies that go beyond the making of products or services for short-term use or pleasure. They need to be systemically shaped, embodied and embedded, for deep change and care to be realised, unsettled and reclaimed.

They too will need to engage with notions and values of situated use and repair and perhaps contribute to their being care-fully supported, taught and researched.

Towards 'an anticipatory ethics of future care by design'

'Care by design'

Design schools in one way or another are already involved, directly or indirectly, in working with an ethics of care.

We see potential in an ethics of care and its design-related focus on environment, ecologies and economies (Wilde et al., 2022) to be rethought in a more relationally as 'care by design'.

We will need to work collectively and critically to take 'care by design' into places of education and professional work in order to propel us into alternatives to the current crises in which we are struggling so that our students work to secure futures together for our students. This we see even further room for design in uncertain and shifting times as being ripe for engaging creatively and critically with 'an anticipatory ethics of future care by design'.

As we look towards designing design education and the trajectories of students to working with care in professional design and transdisciplinary knowledge exchanges and co-creative research partnerships, such a notion of care, design work and its working offer us key sites and dynamics for realising and contributing to wider societal understanding of care, services, well-being and ethics that 'reach out to something other than the self' (Tronto 1993: 104).

Given the brutal effects of climate change so evident across the planet, and the continuing lobbying and market-driven logics of global extractivist capitalism, design schools have options, actions and activities as central to the shaping of design professional futures through exploiting and instiling an ethics of design as care. They can and must, in our view, work care-fully, creatively and critically, through practice and into its contexts of action, physical and digital [→ SEE **FEATURE 10**].

This too, we argue, needs to be 'care work' and work of care-full futures in design educational ethics that reaches beyond graduation and also back from the worlds of work into lifelong learning and 'executive master's courses, with PhD graduates enlivening our master's studios and PhD seminars, to mention a few possibilities.

Care in active presents

More remote futures within the 21st century along with their changing design futures literacies may be ones we cannot quite fathom today, educationally or societally. We will need to anticipate design learning futures and lived everyday futures in active presents, not only futures in our immediate everyday lives.

In these contexts, other human and non-human anticipatory ecologies will continue to need to survive and to change and we humans will continue to need to learn how to live with and ensure an ethics of extended care, that is beyond our anthropocentric lenses and legacies of designing in our own wished image.

Shaping cultures of anticipatory cultures of care through designing and agentive design futures literacies, will depend on being able to adapt to changing contexts and conditions, and to keep on being engaged with design futures literacies though connected agencies of care and care of our transformative design futures agencies. Long may we care for care-full futures. Long may our activation of futures of care in design education flourish care-fully.

PoliMi PhD project

GROUP: 4

YEAR: 2020

TEACHER: Manuela Celi

STUDENTS: I. Bastarrica, S. Crotti, K. Fabrin Jakobsen, K. Gupta, Z. Yanyan, M. Zanchi

TAGS: Reputation. Equilibrium. Virtuality. Collaboration.

Balance

A smart wearable device and service that tracks your good and bad deeds. Doing good deeds creates a better world, with Balance these positive actions are converted into points in a digital world where your personalised avatar can be judged for your behaviour, encouraging an empathic lifestyle.

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AGENCY, ENACTMENT AND DESIGN FUTURES LITERACIES

BY Andrew Morrison, Manuela Celi & Oscar Tomico

WITH Palak Dudani, Guim Espelt Estopà, Jana Tothill, Roger Guilemany, Mariana Quintero, Silke Lange & Jomy Joseph

1. Introduction

BY Andrew Morrison, Manuela Celi & Oscar Tomico
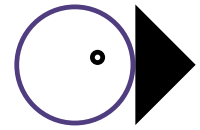
On hold, holding on, letting go

Perhaps because it is difficult to know what the future holds, the future has a hold over us. As Grosz recounts, the unavailability of the future to knowledge is what propels us forward; in Hermann Minkowski's philosophy, the future is a mysterious and majestic horizon 'without which we could not continue to live' (in Grosz 1999: 21). Inherently full of surprises, 'newness', unknowns and the 'untimely', the future is a fundamentally active force, it has agency. From this perspective the future does not only surrender to our sciences, control and occupations. To the extent that the future holds surprises, unknowables and, importantly, others or 'future people' who will have the capacity to change us, to reframe our present and rewrite history, the future has a 'decolonising' power. (Mazé, 2016: Kindle).

In Design Education Reconsidered in Volume 1, we provided a schematic overview of relations between design, learning and transformation. This we placed within a situating of design pedagogies in relation to sociocultural frames of learning and related perspectives of critical creative and emergent practices of un/knowing. This we see as part of changing our design studio centred pedagogies to address changing contexts and trajectories of learning out of the university and in a digital age. In short, this is a matter not of keeping matters on hold, or holding on, but also letting go and venturing forth in a mode of futures shaping agentive, transformational and relational knowing through design anticipatory learning and related transformative pedagogies (Figure 1).

In Essay 2: Altering Prospective Design Pedagogies we took up a set of topics relating to design futures literacies and their institutional contexts and constraints. Highlighted was the importance of agency on the part of teachers and students in shaping futures literacies by design. In this essay we turn to a closer look at the roles of agency in ways we conceptualise and enact design anticipatory pedagogies in times of increased complexity in what Cope and Kalantzis (2011) term an epochal shift in the balance of agency in a changing knowledge and creative economy and society.

Such a view highlights learning as centred around not only materials or shaping tools, products, interactions, services and systems. Nor is it limited to reflecting on and reflexively developing design-centred futures learning analytically. What it in addition highlights is the importance of agency in regard to learning events and to learning as an activity in which designers' productive and critical making and action is central. These too are necessarily connected, in an anticipatory design perspective. This is further

about interplays between aspirations and actions in design learning and teaching and to the roles of futures imaginaries, practices and mediations futures in and as design education more broadly.

As we reach for and work with these many aspects of agency in critical creative making and reflection, human and non-human actors entwined in processes of designs and design knowing coming into being. In learning to learn and to unlearn design in these ways, that is as students and educators, we also need to be open to the force of norms and the pull of trends [Figure 1]. Then there is the glow of the speculative and the hard ground of making choices out of multiple possibilities and continuing to learn with the trajectories and consequences that follow and emerge.

Design making and its presentation, critique, analysis and evaluation, as (Mazé & Wangel, 2016: 286) remind us, needs to work actively and responsibly as critical practitioners and communicative researchers. They articulate the everyday of futures making and see design as working agentively to frame, reposition and articulate a diversity of positions, participation and practice, as follows:

> *Futures can be understood as an everyday practice, made by professionals who are circumscribed by systems and structures reproducing the ideals, knowledges and material realities of individuals – but who must also take responsibility for their assumptions, agency and power. We are privileged in our professional roles and social positions, and as critical practitioners, we acknowledge the power dimensions and politics in how we select, prefer and privilege one reality over another. Indeed, as critical practitioners we work from the 'outside in' and 'inside out' to bring new social-critical and feminist theories to destabilize the status quo of prevalent ideologies and ontologies embedded in the context of design futures, and we also work through our professional and personal practices to explore and live through alternative ideologies and ontologies. Inevitably, futures studies and design are embedded with preferences, subjectivities and normativities. However, futures studies and design can also be plural, positioned, and explicit about preferences, subjectivities and normatives, allowing other forms of agency, participation and practice.*

Orientation

Here are a few of the questions we take up below:

What then of such critical engagement in and as agency?

In our design futures pedagogies whose agency are we talking about?

And then, whose agency is in play and what ways with and for whom?

What's needed to support our students in developing their own design futures agency?

How might students' design futures agency be composed and realised today to fuel futures designing when they leave their studios, courses and projects?

How can we prepare and prime them to become active participants, contributors, and design makers in shaping futures design by their own active performative engagement? And to do so through design?

The chapter has the following main sections. Next we move on to educational framings of learning, agency and transformation through 'Sociocultural perspectives on learning'. This leads to a third main section on 'On agency and learning'. There follows an expansion in the fourth section entitled 'Rehearsing learning futures through designing'. Following this, in the fifth section, matters of agency, purpose and context are covered in 'Towards transformative long-term resilience. In section six we take up dynamic relations of between agency and futures literacies, leading to a final closing section.

Figure 1 ▲
PhD BALLUSION on site workshop, AHO, autumn, 2019. Part of the
DESIGN FUTURES LEXICON. Making and shaping relations in design
futures learning. Having popped balloons containing selected
terms from the 50 FUTURES DESIGN WORDS, students select key
items that resonate with their own thesis work (round balloons).
They use long thin balloons to annotate their own relational
ontological framings and join these terms in group work in
slippery, squeaky, delicate and seriously playful relational forms.
(Image credit: Palak Dudani).

2. Sociocultural Perspectives on Learning

BY Andrew Morrison

Changing contexts

Dynamic literacies in action

In the learning sciences, sociocultural approaches to teaching and learning (e.g. Wertsch, 1991;1998) centre on relations between context and situations of learning (Lave & Wenger, 1991), processes of students trajectories to becoming independent and self-directed, and where tools and mediations are central to the generation of dialogues in which content and contexts are in constant interplay. In this view on learning, dialogue may be inter- and intra-personal and it is realised through socio-material practices through which processes and agency are materialised. In a sociocultural frame, literacies are dynamic (Kalantzis & Cope, 2012). They emerge through contexts of enaction and exploration and are socio-culturally situated (Lave & Wenger, 1991. They are performed via the active interplay of tools, signs, media and modes of making meaning by individuals as well as collaboratively (Vygotsky, 1978; Wenger, 1998; Wertsch, 1998). As we touch on in Part 1 in Design Education Reconsidered, relations between educational theory and design learning are often not deeply framed in terms of learning theories. Nor do the latter often refer to knowing through designing and the multimodalities in design learning. Pedagogies of the future and futures of pedagogies are in need of elaboration in post-normal times and in the complex learning and political-ecological contexts and emergent practices of continuing to work with uncertainty, with the reconfigurations of interests and power alliances and related policies, and in ways knowing through making may matter even more in contributing to more sustainable and equitably shared futures. Writing about learning, agency and the city, Morrison et al. (2019: 205-206) outline that:

> *Socio-cultural theories of learning, in particular, draw attention to processes of negotiation, meaning making, and learning in which young people come to operate as 'agentive selves' in situated cultural practices (Gutierrez & Rogoff 2003; Hull & Katz, 2006; Lave & Wenger, 1991; Rajala, Hilppö, Lipponen, & Kumpulainen, 2013). Such cultural practices are increasingly understood as dynamic, distributed across space and time (Erstad & Sefton-Green, 2013; Morrison, Aspen, & Westvang, 2013), and, with the advent of mobile and social media, have taken on a distributed, location-based, and self-directed character, offring 'new mobilities' (Leander, Phillips, & Taylor, 2010). In such contexts, communities of cultural and technological diversity represent different opportunities and barriers for participation, engagement, and transformation for young people in processes of re-imaging the urban (Amin & Thrift, 2002) and learning to 'seelikeacity' (Amin & Thrift, 2017).*

Young people's realisation of their own agency through these processes may draw on a mix of media, narrative, fact, and affect as part of the dynamic process of co-constructing identity, interests, and knowledge. How they give body and voice to their views can be seen as much in action as reflection, demonstrated in practices that bring together multiple activities in a form of 'cosmopolitan' practice (Hull & Stornaiuolo, 2010; Stornaiuolo, Hull, & Hall, 2017). Such agency, however, can also be realised via educational interventions, through the design of curriculum and learning activities and events that are a part of an experimental and 'change laboratory' mode of providing means and conditions to facilitate learning activities and outcomes (Haapasaari, Engeström, & Kerosuo, 2016).

Transformations in student learning have been taken up concerning place and places of learning, (Ellsworth, 2005) and in terms of agency and nomadic pedagogies (Fendler, 2013). In our own earlier work, we addressed this through mapping physical, learning and mediational 'journeys' (Snaddon, et al., 2019a) and in conceptualising and exploring situated cases of 'design-based learning ecologies' in the Norwegian Arctic and in South African urban settings (Snaddon, et al., 2019b). For Leander et al. (2010), this is about mapping new mobilities in learning, ones that are about learners negotiating their own changing situated personal and shared identities in changing contexts of 'digital learning lives' (Erstad, 2013; Erstad & Sefton Green, 2013; Erstad et al., 2016).

Transformational learning

With the advent of mobile and social media learning has taken on a distributed, location-based and self-directed character. In many respects it reflects trends towards seeing learning as occurring in time and space, not only confined to the venue of the classroom, lab or studio. Transformative learning (e.g. Haapasaari & Kerosuo, 2015) has been concerned to see how learners operate as 'agentive selves' in cultural settings (Hull & Katz, 2006; Gutierrez & Rogoff, 2003) in which they go about processes of defining their identities, inquiries and related productive communication with respect to settings, topics and participants.

Learners are seen as taking part in processes of 'unfolding lives' (Thompson, 2011) that are to do with their own negotiative meaning making and situated learning rather than merely conforming to given, deliberative curricular frames. How learners experience these negotiations has been examined as connected to how they derive purpose in contexts of their daily urban lives, as adolescents and young adults (Erstad, 2013), and how engaged and productive action may stem from their collaboration and peer practices as well as through emerging wider cultural movements around DIY production, social media memberships and special interests that toggle between the digital and physical environments (Li, et al. 2017). A mix of media, narrative, fact and affect occur in these activities and their dynamic and relational co-construction of identity, interests and knowledge building.

Transformative learning may be said to be interested in ways learners see themselves, in relation to their contexts, content, devices and tools. These elements are understood as a whole in terms of cultural articulations. These are articulations that are about action, agency and autonomy as much as reflection (e.g. Rajala et al., 2016).

They may involve self-selected and emergent practices that are made of multiple activities and perspectives, a form of 'cosmopolitan' practice (Hull & Stornaiuolo, 2010; Stornaiuolo et al., 2017). In terms of transformational education, interventions and change laboratories may be used to facilitate learning activities, events and outcomes (Haapasaari et al., 2016) and where time is also an acknowledged component (Rajala, 2013) together with distributed modes of doing, acting and learning.

In contrast to the socio-cultural and activity theory inflection of such approaches, views on transformative learning has also been influenced by experience in adult education and lifelong learning with focus on processes and open frames for negotiating change, perspectives. Transformation in learning has been championed by Mezirow (1991, 2000, 2009) who sees it as '… the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one's experience as a guide to future action' (Mezirow 2012: 74).

Towards situated, ethical action

These views from the learning sciences, and the growing attention to learning spaces and places however have not been very widely and patently taken up in pedagogies of transformation in schools of architecture, urbanism and design, despite their concern with the built, locative and mobile in design [→ SEE **FEATURE 1**]. Agency has been taken up in design research and research on design education (e.g. Neubauer, 2022; see below, this essay); however, rich conceptual and applied studies from the learning sciences remain largely uncited.

It is to recent work that we turn next on learning and agency in sociocultural learning theory and also Cultural Historical Activity Theory (CHAT) that builds on the work of Vygotsky and related Soviet/Russian/Ukrainian theorists. Here we refer in particular to the work of colleagues from the University of Oslo on literacies, learning and futures with agency as the focus.

> *In the ongoing struggle toward an equitable and sustainable world, the talents of design and critical thought are required. So are realism and pragmatism about the limits of agency and the risks of imagining potency where there is none—or where it might unleash other ills. We are always in a Beckettian dilemma—caught in the spaces between activist engagement and false consciousness, unable to fully know how we are forming the basis of action or imagining our own efficacy, and yet, unable (for reasons of conscience, survival, ethical belief) to turn away from that engagement. … We simply must guard against confusing the coercive force of moral imperatives with the difficult process of ethical deliberation when conceiving a foundation for action. (Drucker, 2020: 2).*

PoliMi PhD project
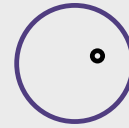
GROUP: 9

YEAR: 2022

TEACHER: Manuela Celi

STUDENTS: Mayara Menezes, Qingxia Li, Rui Li, Ruonan Zheng, Zhuoying Liao, Zi En Chong Zein

TAGS: Non-human. Unlearning. Knowledge.

Mettā Shoe

An all-weather smart footwear connected to the future city-forest's database, providing a warning signal when it detects a minor living creature on your walking path, avoiding stepping on it. The aim is to achieve a biota co-living with vegetative beings, reducing speciesism against these minor living creatures like insects, which are killed and affected by people's pathways.

3.
On agency and Learning

BY Andrew Morrison

After Vygotsky

On transformation

In seeking to expand on Vygotsky's dialogical-dialectical approach to learning and change, Stetsenko (2017: 197) highlights two principles concerning transformation. She argues that epistemically, 'we-know-the world as we change it'. Ontologically, Stetsenko claims, 'we-come-to-be-as-we-change-the-world'. These aspects we have addressed in FUEL4DESIGN [→ SEE **FEATURE 2**]. Our approach has been similar to the framing of agency in learning by Lund and Vestøl (2020). They argue for a view in relation to learning activity and events in which there is a dynamic '... dialectics between the situation and the agent(s) enacting such principles requires capacity to instigate and sustain transformation in order to improve on the original situation.' (Lund & Vestøl, 2020: online).

Lund and Vestø continue to argue that this is a capacity of transformative agency. However, they see transformative agency as in need of 'a unit of analysis that captures the dynamics and dialectics between problem situation and agentic and transformative use of resources.' (Lund & Vestøl, 2020: online). Agentive learning has been conceptualised in learning activities and events as ranging from interplays around contradictions and tensions in collective activity (Haapasaari et al., 2014) to framings of relations of transformative agency and digital literacies (Lund, et al., 2019).

Here, as in our project, students and educators oscillate between, and synthesise and differentiate between, content and phenomena, processes and experiences, activities and products/services, and cultural, socio-technical and environmentally located resources and their own related artifact and process 'compositions'. In summary, Lund and Vestøl (2020: online) propose 'A dialectic unit of analysis aims to capture reciprocity; the interplay between volitional action and use of resources to break out of difficult situations and resolve them.' This unit is proposed to help us tackle fizzy and wicked problems and the contexts of crisis, change and our pedagogical and learning as transformation and transformation through learning. In such contexts, and in contrast to traditional notions of agency, transformative agency may be conceptualised, according to Haapasaari et al. (2014: 233), from a Cultural Historical Activity Theory (CHAT) view, as materialised through conflicts and contradictions within collective activity and ensuing envisioning of alternate and new possibilities. The overall aim is to reach into and support processes of transformation in student learning and in pedagogies.

Engenes and Lund (20220 and Lund and Engeness (2020: 2) see the work of Galperin and a recent collection of his essays, as providing some key foundations for conceptualising agency and teaching-learning:

> *In Galperin's theory, the agency of the learner engaged in the learning activity is inherently connected with i) the orienting part of the learning activity (i.e., how agents become increasingly aware of uncertain and fluid meanings in diverse contexts) and ii) the transformation process of the forms of the activity that learners engage in, including the learner's external, social, and internal individual activities. In the process of such transformation, the learner encounters problems or situations characterised by fluidity, changing conditions, alternative responses, and other challenges that require more than mere automatic responses (Arievitch, 2017).*

Referring to a set of key lectures by Galperin, Lund and Engenes (2020) point to his outline of six consecutive and enactable phases in the shaping of learners' transformative agency: 1) Motivation (formation of learner's attitude); 2) Orientation (learner's understanding of the scope of a task and the conditions for its realisation); Materialised action (by learners via artifacts and their own representations in their doing the task); Communicated thinking (that is expressed primarily through language); Silent speech (where inner processes, reflections and personal thinking occur); and, Acting mentally (in which thinking s externalised and may include image and meaning making with artifacts). This list may be revoiced in terms of multimodal multi-literacies of digital design futures (see Volume 1: Venturing into Design Literacies) to contemporary and emergent prospective contexts (Aagaard & Lund, 2019).

In a related article, Engenes and Lund (2020: 7) reflect that:

> *In summary, Galperin's contribution was in: i) specifying the unique character of human mental development emerging in social activities and cultural, tool-mediated, practices; ii) conceptualising the nature and functions of human psychological processes as specific forms of activity, by outlining its structure and identifying the subject of psychology in studying of object-oriented activity in its ontogenesis; and iii) identifying the role and the function of tools as imbued with relevant social experience and mediating learning activity.*

About transformative and relational agency

For Lund and Vestøl (2020) it is the interplay of a problem situation and accessible resources that allows us to further conceptualise transformative agency. As we address in most of the chapters and essays in this book, such interplays engage design students and educators in a futures view in reaching into prior, current and emerging experience and critical reflections; they ask that we face challenges and a need for adjustment and a good measure of flexibility and adaptability while still needing to make choices and present and critique chosen designs, even where these offer options and alternates. Our design students at master's level are not yet professional designers yet need to engage in shaping futures they need to imagine and inform through inquiries that may

be constrained by world views and aspects located in the past and present. Equally, our doctoral students are in processes of learning to conduct what are often practice-based studies, ranging from the speculative to the empirical, commercial to community centred. They are in engaged in this while learning how to themselves move within the very dynamics of different modes of knowing (making-analysing) and communicating and reflecting exploratory, possible, plausible and potential design informed futures projects.

Further, in our view, designing itself needs to be understood as a matter agency that is enacted, entwined and liminally performative. It is constantly reaching for another form and frame, now avant-garde, next overstating its innovative force, and being returned to pragmatics present contexts. All of these activities and their engaged participation need to be understood also in an interplay between pedagogical agency and methodological activity in a futures onto-epistemological dynamic. Designing and design learning are constantly restless, innovative and yet also infused with conventions and traditions that are themselves contributors to our pedagogical possibilities and attendant dilemmas of realising transformational learning. We cannot foresee futures, nor can we foresee how learning as transformation will directly, deterministically or normatively play out for students.

Such dialectical and dynamic in design and design research can be further understood, as Lund and Vestøl (2020) argue, through reference to the concept of 'double stimulation' and relational agency (Vygotsky, 1978; Sannino, 2015; Sannino & Engeström, 2017). A first stimulus (S1) represents a problem situation. A second stimulus (S2) refers in principle to the diversity of resources that are put into play and allow an actor to perform processes of learning. In FUEL4DESIGN this is about complexity, uncertainty, changing conditions and challenges to design's ontological status and epistemological practices in the arena climate change and geopolitical and environmental crisis.

Concerning S1, in an anticipatory design pedagogical frame, contradictions, ephemerality and challenges to motivations to act and aspirations for change are often overwhelmed by the force and forces at play in deep changes in human and non-human systems. How educators and learners see themselves in these settings is of key importance in how and here they see a need and potential to act, and where their contributions may assist in shaping shared futures that are more equitable and sustainable.

For designers this is a dynamic set of intersections between spaces, materials and activities as much as it is about affect and experience, robust or glitchy technologies or disruptive of convergent alignments with norms or expectations and the formations and institutions that drive and direct them. For design students, a second stimulus (S2) is crucial. This is important when design futures learning itself is reaching beyond givens of the here-and-now while informed, historiographically, by design and societal histories and contexts. The second stimulus is motivational. It is about the stimulus to act, to articulate futures-oriented design, through the learner's own agency.

Agency, systems and structures in our view, as argued earlier in the Essay 1: Anticipatory Design Literacies, are intertwined, relationally, as Lund and Vestøl and also Stetsenko argue (see also Essay 1: Anticipatory Design Literacies). In the dynamics of learning and shaping futures by designing, we work relationally with a diversity of means, collaborative design processes and diverse participants along with time as a design futures cultural resource and chronotopical material (see Essay 4: Time Design and Anticipatory Learning).

Such a view on agency, threaded through design above, in our view, is central to shaping futures by design and design pedagogies. We concur with Stetsenko (2020) that there is an urgent need to delve further into agency and transformative learning. Her position is one that accentuates activism.

Design, agency and learning

Design educators work every day with agency in design and in their pedagogies. The large body of work on Participatory Design (PD) and Co-Design attests to the seriousness with design has taken up action, participation and collaboration in design as making and inquiry. The engagement of 'users', participants and stakeholders in the political processes of the framing of issues and needs and transparent decision-making, along with centred design more generally, places human agency at the core of many of our approaches to design studio and group projects. It is also important in placements and practices of knowledge shaping and sharing with external partners, in design and in research activities.

The framing and analysis of agency in design learning, however, has not received much attention in participatory design research as learning, with less still on participatory pedagogies. This may be due to the way in which design project and research work towards facilitating the agency of participants. However, many of the principles and studies of engaged agentive participation may be more fully connected in our ongoing studies of design learning and would benefit from engagement with experts in design participation, from design but also from the learning sciences. Further acknowledgement and force would also be beneficial from the challenges to the modes and representations of agency from scholars and practitioners in decolonising design and long-term systemic views from indigenous wisdom, as Burns (2015) argues. (See also the final chapter in this volume, entitled Design Futures Learning Otherwise).

Just such exchanges may be fruitful - as is underpinned by deep feminist practices and theorising about participation, agency and representativity that has informed much of PD in drawing on design expertise and teaching from feminist new materialist designers and educators. Their work accentuates human non-human relationality in looking to the role of matter and mattering in nonbinary engagement between the bio-ecological and the human-cognitive, to simplify a more complex dynamic.

This is apparent, for example, in the work Lindström and Ståhl (2016) in their 'Becoming response-able stakeholders: participatory design in times of uncertainties'. In their view, we are in processes of reconfiguring agency and bio-material participation in un/

learning in the design and its roles in shaping a contaminated planet (Lindström & Ståhl, 2020; see also Akama et al., 2020). A similar argument is advanced by Neubauer (2022. 104) in 'Materializing the agency of design in innovation practices'.

Pihkala and Karasti (2022) extend feminist new materialist approaches to examine the potential and practice of agency in PD. She clearly argues for attention to our relinquishing of our typical human notions of agency: 'While asking us to relinquish agency, feminist new materialisms also challenge us—from our specific historically contingent and materially embedded locations—to actively take responsibility for the kinds of knowledge that our practices of engagement enable to materialise'. They provide a useful suggestions for an 'anthropocenically situated' design education:

> *A feminist new materialist praxis of response-ability can add to the imagining of 'doing PD' and 'being designer-researchers' otherwise. We suggest that 'response-able PD' could mean PD that takes seriously the role that design and research practices play in bringing about worlds, seeking ever more inventive ways of making a meaningful impact not only by how we engage during our projects but also by how we understand and plan for 'more-than' projects. In such projects, the starting point is in the middle, reaching across contexts and times and plugging into the flows of always-already emergence to build ethically sustainable worlds. (Pihkala & Karasti, 2022: 106).*

Things clearly have agency and climate and financial systems are complex and rapidly changing while our human notions of effective action need modesty and rethinking in a globe where custodians of the environment who exercise stewardships of balance and protection of species offer an other-wising of agentive knowing. In her work Neubauer (2022: 91) sees that we need to reconfigure artifact thinking too in a relational view on design agency, writing that:

> *Reading material relations in practice contributes to visualizing the agency of design. Creating an idealized linear representation of this process of design configuration represents my attempt to make this concept useful and succinct. It sharpens the attention to material networks in design practice. Conceptualizing design in this way foregrounds the deliberate cultivating of imaginaries as interventional artifacts within practices.*

One might suggest that our design futures pedagogies might need to be extended even further in exploring an anticipatory agency of design and design agency of students. This would involve us all in learning with and through things and the environments and systems and non-western knowledge ecologies within which they survive and from which we might learn together in shaping futures by design and as futuring in design education. And perhaps some rethinking of 'double stimulation' and new conceptualisations together with learning theorists 'in the wild'.

PoliMi PhD project

GROUP: 3

YEAR: 2020

TEACHER: Manuela Celi

STUDENTS: Beatrice Calomeni, Francesco Maria D'Errico, Marco Pizzi, Sara Prevosti, Andrea Somma, Matteo Maria Tagliabue

TAGS: Feeling. Knowledge. Agency. Self-awareness.

Me Mo
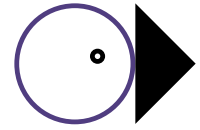
The fast pace of our daily routines might opaque our memories, to avoid losing them you may pin them through a visual representation of what you felt during the day. This is achieved using a set of tools; each depicting a specific emotion. Anytime you want to freeze a moment of your life, you interact with the tool of the memory you want to frame.

4.
Rehearsing Learning Futures Through Designing

BY Andrew Morrison

Rehearsing future matters by design

Action, knowledge, ethics

Working to realise an active, critical, productive and societally and environmentally meaningful mode of agentive learning is perhaps all a matter, at one level of a set of 'future matters' of rehearsing futures by design (Halse, et al., 2010). Adam and Groves (2010) articulate future matters as action, knowledge and ethics. These are matters in which futures are imagined and also made (see also Yelavich & Adams, 2014).

In anticipatory rehearsals by design, our attention to methods and to scenarios in particular are crucial (Candy & Dunagan, 2017) and especially if design is to reach not only within but also beyond its own workings. This matters if it is to engage critically and productively with other specialists and diverse participants and knowledge communities and to situate these temporally as much as pedagogical and in policy. That is, in times of crisis, in looking to engaging and revitalising design within a deep-time view that seeks to grown and nurtured beyond the here-and-now and the poverty of cultures of design mediated consumption infused with momentary, instant gratification and posturing, vapid presents.

Criticality in the present - for long-term sustainable global survival and vibrant and even joyful futures - needs to be partnered with processes and permutations of possible, likely and imaginary multiple futures [→ SEE **FEATURES 3 - 5**] that demand psychological, cultural, technical and creative inputs (Brassett & O'Reilly, 2021) and dynamic problematising approaches that are key contributors to wider emergent realisations as anticipatory design and learning.

We have positioned this as follows:

Anticipatory Design works to shape and to interpret transactional, imaginary and exploratory inquiry and engagement, ranging from the built to the sensory. Drawing on diverse disciplinary practices and modes of inquiry in design research and practice, Anticipatory Design offers a counterweight to strategic decision-making of foresight in Futures Studies. It does so to expand intersections of materials, tools and methods of making and shaping futures contextually and systemically, along with processes and articulation of cultural imaginaries and expression.' (Morrison, 2022: online).

'Rehumanising futures by design'

Anticipatory design is to some degree embedded in processes and practices of repositioning of 'design in crisis' (Fry & Nocek, 2020) in an Anthropocenic age (a contested term). In such conditions and historical and emergent contexts, anticipatory design is oriented towards preparedness for uncertainty, yet informed preparation.

This is possible when the empirical and the imaginary are put to work together, not as separates. They are collected and coordinated, distinguished and rehearsed. Here 'fuel' is needed, by way of encouraging curiosity, through briefing and building anticipatory awareness (Celi & Colombi, 2019) and by encouraging a healthy skepticism to givens and assumptions.

This is akin to arguments advances by Edeholt and Joseph (2022) who motivate for a rethinking of relations between design and futures through the notion of 'refuturing'. However their perspective is a more critical and design-driven view on means of anticipatory design. In his related doctoral thesis work entitled Refuturing Studies: Rehumanizing futures through/by design, Joseph (2023) he presents a practice based speculative design study of journeying from 'what-is' to a 'what-could-be' and open out our design imaginary thinking and a conceptual space for refuturing via speculative critical design.

Joseph's own agentive generation of a speculative design fiction as a space of opening out and his designed narrative or diegetic prototypes allows him '… to imagine alternative futures through the designed artifacts to make the diegesis of a desirable future that doesn't exist in relation to what does.' (Joseph, 2022: 23). He uses the metaphor of a wormhole to move between the what is (P1) and what-could-be (P2).

Joseph writes that in his use of deigetic artifacts:

> … this investigation uses diegetic prototypes or diegetic artifacts here in a more specific capacity to wormhole through the worlds of P1 and P2, where they generate the world of P2 in which they live and relationally shape the artifacts in the world P1. Thus, in this case, the diegetic prototype is negotiating and creatively brokering two diegetic realities, P1 & P2, the what-is and the what could-be, and building a conceptual wormhole between them. These diegetic artifacts thus creatively broker these unstable and transitional realities such that one suspends disbelief about change from one to the other. Thus in this sense, the diegetic artifacts developed here emerge from this creative negotiation between these structured worlds in the alternative now …'. (Joseph, 2023: 22-23).

In his study, Joseph has devised two intersecting volumes of inquiry, one a narrative imaginary account (Joseph, 2022) entailing short narrative fictions from an imaginary future located research journal from AD 2031 entitled *The Open Journal of Refuturing* and an analytical exegesis and related academic publications (Joseph, 2023) that discusses these design fictions and their rhetorical stances along with related physical products and exhibitions and seminar spaces within which they were positioned discursively (Figure 2); [→ SEE FEATURE 6].

LEXICON at NORDES Summer School 2020

BY Palak Dudani

BLOGPOST: 01.12.2020 / Design Futures Literacy

AVAILABLE: Link ↗
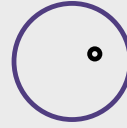
PhD researchers in Design often face challenges about how to select and position transdisciplinary vocabularies that are suited to their specific project as well as the changing character of their design domain areas. This is also quite a task when a practice-based doctorate needs to engage in future related inquiry and scales of the possible, probable, projected and putative.

The NORDES Summer School 2020

The NORDES Summer School 2020 was a 3-day online event held on 5-7 August 2020, hosted by AHO and OsloMet in Norway. With the focus on 'designing beyond the individual', the summer school explored how the theme of COLLECTIVES may 'inform design inquiry in shaping futures that are shared and honed for common interests, needs and purposes, not only competitive and collaborative ones.'

The summer school was open and free for doctoral candidates with an overall aim to inform and strengthen understanding of the collective in their doctoral inquiries,

with a specific emphasis on 'examining and elaborating on related actions and methods, and situating the challenges and potentials for designing and researching design for shared and sustainable survival, via creativity with critique.' During the summer school, a two-hour activity called 'Languaging collective futures' was presented and facilitated by Andrew and Palak. As facilitators, our view on this activity was to bring forth the potentiality of words and how they open possibilities for 'futuring'. These issues were taken up across the three-day session. The overall aim of our activity within the workshop was to relate to the language of collectives based on FUEL4DESIGN LEXICON. During the first day of the summer school, participants discussed and identified key issues raised by readings on COLLECTIVES, the differences, similarities, and questions. They visually mapped some of the connections between identified issues in the literature, highlighted connections between key issues, philosophical positions, contexts, and actors.

▲ Figure 1. A screenshot of the NORDES Summer School 2020 webpage (above).

▲ Figure 2: Day 1. Literature mapping by group 4 (below).
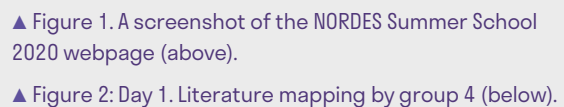
The participants worked on positioning their own projects on the second day of the summer school. They connected the dots of personal projects and focused on how their project related to the theme of collectives with regards to research questions, theoretical frameworks, methodology, and socio-political context.

Our activity focusing on LEXICON took place on the second day. Through the group activities throughout the days, participants collected a list of terms which would be put into focus during this activity. After bringing attention to the words, the participants were given the task to play the REFLEXICON game.
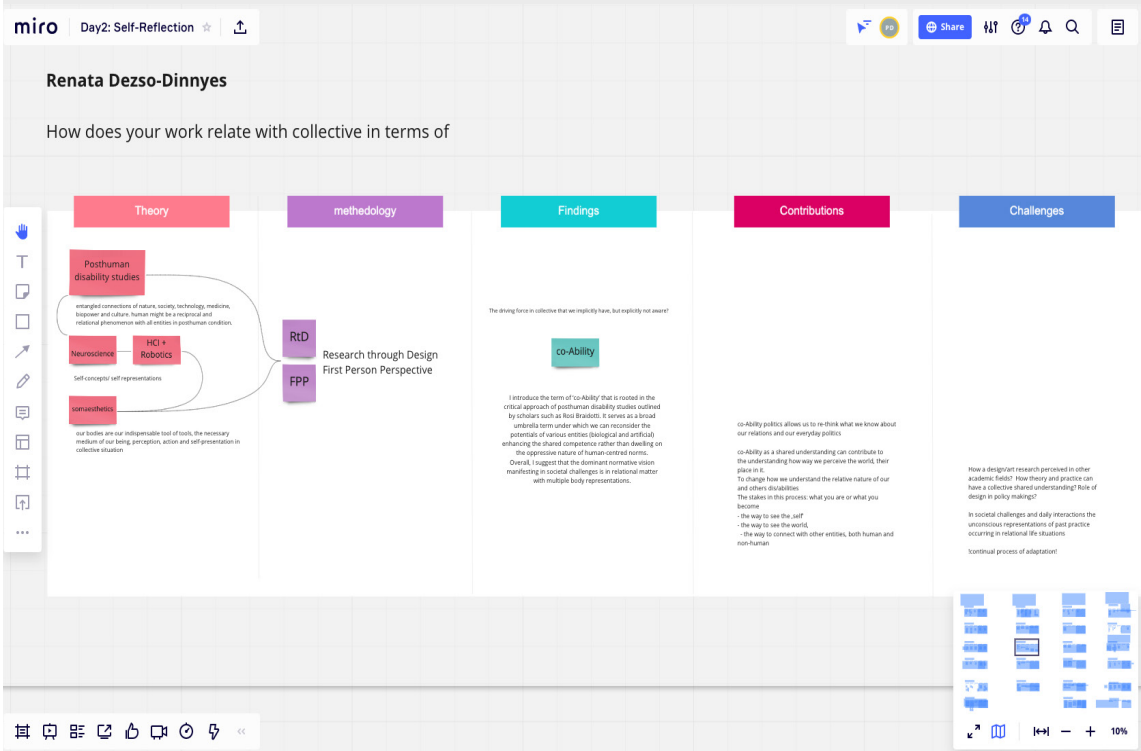
Here are a number of comments from PhD participants:
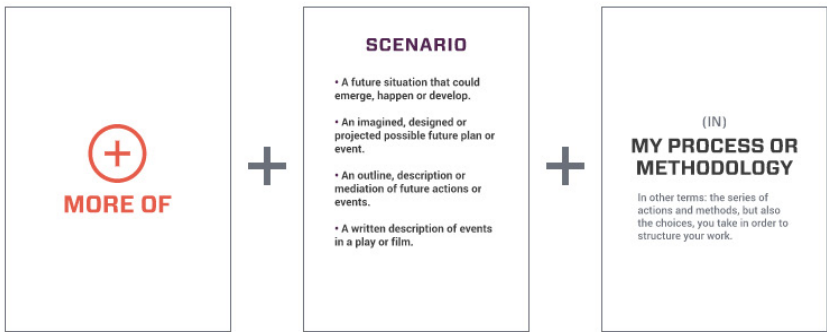
Hanna af Ekström : Thank you for showing us the games. Just played the first one and it reminded me of feminist reflexive writing. To just try to imagine possible futures and even a beginning of how to make the thesis conclusion was really nice. Sometimes we forget about that, that our PhD actually has an end (and a new beginning)

Maryam Fanni : I tried the "More or less" and appreciated it much. I approached it as some form of automated challenging questions posed to me at a seminar, for example "what if you would be more speculative in your method/process" etc. Of course some questions resonate more and some less, but very useful!

Clarice Garcia : I was thinking that the situation (the last card) could be a sort of "open source" card. Maybe, before starting the game, the participant could be invited to create a list of situations that came up with COVID-19, and it could bring a diversity of problems, questions, or situations, from different contexts and perspectives.

MairiClaire MacDonald : I can see the reflexicovid being a wonderful tool to present to the design students when we return to teaching. It generates immediate and interesting 'brief's which are immediately understandable and have many possibilities for design to manifest.

Maryam Fanni : This one is more "game-like" in the sense that it could contain more innovation and humour and allow tentative and perhaps even nonsensical approaches whereas the other one, more-or-less, was more relevant to one's own project/thinking.

Clarice Garcia : Also, a reflexion about ethics is a sensitive topic that permeates this discussion. Could we have a card to investigate how people are addressing ethics?

Jomy Joseph : I would even add a "wild card" that could also completely shift the trajectory of the reflections.

Becca Rose : 🌱 I suppose this is not a reflection on the game itself, but more about how we connect with each-other through design/making processes.

MairiClaire MacDonald : When in speculative spaces it is sometimes so valuable to be 'wild' not 'mild'.

The third and last day culminated in focusing on writing and crafting contributions. Here the participants articulated and proposed paper ideas of the conference, collectively writing and producing a summary as encouragement to continue developing the paper for submission.

All in all, this summer school was a very lively event, collective and individually, covering a range of modes of communication and engagement. We hope the material shared here might inspire others to take up some of the resources in the LEXICON, individually, in shared research production and projects, and in other areas of PhD education.

On that score, a lecture on the LEXICON on the topic 'Reflexicon: designing with future terms' had previously been given by Andrew on 26 June 2020 to the PhD school hosted by our project partner PoliMi entitled Designing in Transitional Times. Experiments for futures(s) imagination, 22-26 June 2020. See: PhD programme in Design at PoliMi.

◄ Figure 3: A snapshot of Day 2. Individual reflection on the theme of collectives, in relation to the research questions, theoretical frameworks, methodology, and socio-political context (above far left).

◄ Figure 4: The REFLEXICON game was shared with participants. REFLEXICON is part of the DESIGN FUTURES LEXICON (below far left)

▲ Figure 5: A selection of discussions and reflections by PhD participants (above left)

▼ Figure 6: Day 3. Participants brainstorm ideas for a NORDES Conference 2021.

Example of Master's student work from I03 DESIGIN FUTURES SCOUTING

BY Oscar Tomico, Guim Espelt Estopà, Jana Tothill, Roger Guilemany & Mariana Quintero
COURSE: MDEF 2020-2021, ELISAVA & IAAC. Master's in Design for Emergent Futures.

PROJECT: Hybrid Play

STUDENT: Morgane Sha'ban

Ways of drifting in futures scouting

Morgane Sha'ban, was deeply troubled by some of the wicked problems we face today. Sha'ban was explicitly affected by the profound psychological and environmental crisis we are immersed in, and it was in the overlap of these where she started asking thought-provoking questions. To tackle these emerging concerns, Sha'ban decided to focus on the 'Material Literacy', 'Soil Literacy', and 'Inter-learning' weak signals from the very beginning.

Sha'ban undertook five interventions during the master's in a serial manner. This journey started with her personal affiliation found at the intersection of the psychological and environmental crisis. Sha'ban's serial approach to research allowed her to drift from one interest to the next, building upon the findings and insights of each previous intervention.

For her first intervention: 'Grounded' (Figure 2) she undertook a 24-hour 1PP experiment, which consisted of having skin on skin contact with soil for this period. This intervention was Sha'ban's way of altering her habits and relationships with her everyday environment as a way to get closer and understand the connectedness with nature we can achieve if we give it the time of day (Figure 1). For her second intervention: The 'Soil Layer Game' (Figure 3), she explored the idea of learning through play whilst discussing soil literacy. The learning experience was designed to empower the children by giving them a voice, making the learning meaningful and culturally relevant. By discovering with the children instead of lecturing them, Sha'ban displayed some of the unconventional ways of learning she was so interested in. Her following intervention, 'The air we breathe' (Figure 4) consisted of a workshop with children in which through play, they discussed air literacy, air quality and common global challenges. She appreciated the value in the ability to express oneself more freely with non-verbal communication than with words.
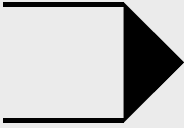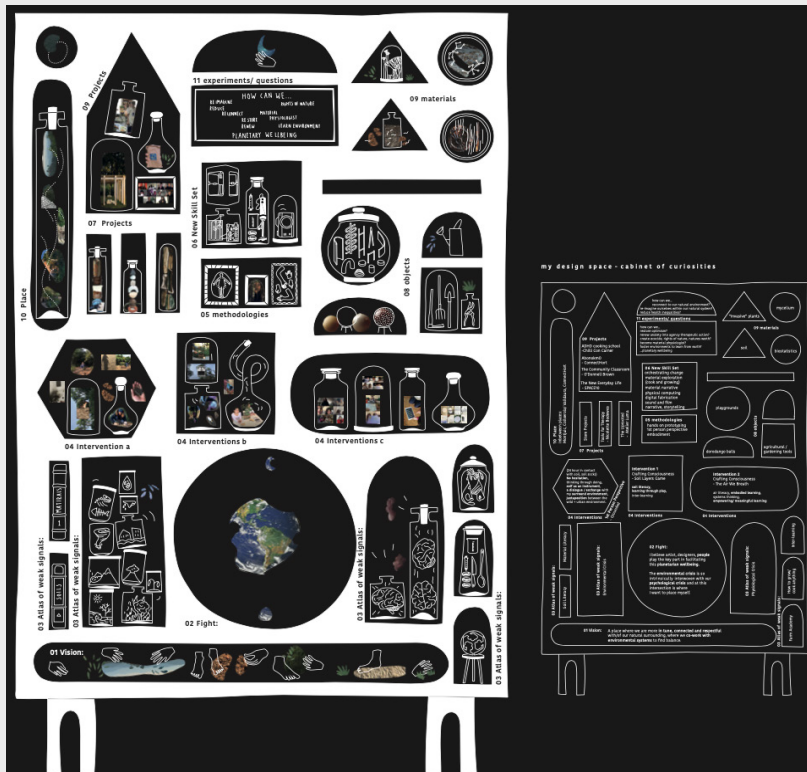
▲ Figure 1: Morgane Sha'ban's Ways of Drifting in Futures Scouting representation (above).

▲ Figure 2: Morgane Sha'ban's Grounded' intervention (middle).

◄ Figure 3: Morgane Sha'ban's 'Soil Layer game' intervention.

▲ Figure 4: Morgane Sha'ban's ' 'The air we breath' intervention (above).

▶ Figure 5: Morgane Sha'ban's 'Conceptual artefact' intervention (right).

Following her interest in learning while playing, she experimented in her 'Conceptual Artefacts Workshop' (Figure 5) with a series of games that questioned our relationship between object and person using creative play.

She then moved on to further explore non-verbal communication. Through the 'Silent Board Game', she wanted to explore how playing with complex abstract ideas, especially for children, might detach ourselves from everyday objects' outcome and function. Sha'ban's final intervention was split in two: one was a 'Biomaterial Workshop' with the children at the Montessori school of Barcelona and the second one was the 'Silent playscape' (Figure 6). Sha'ban wanted to uncover children's agency towards planetary well-being by making them play with objects made by themselves with repurposed materials. In the 'Silent Playscape', players sculpt, build, and made their play in a collaborative silence to demonstrate how much we think and do differently from one another. It consisted of different pieces made from other bio-degradable materials, including bioplastics, wood and canvas, to foster a critical view of the material world around us. The game was an undirected, free play tool. The rules and pieces were adaptable and where you can use your entire body to move, place and be a part of the final sculpture.

The serial character of her journey allowed her to learn from her previous interventions and keep growing from the process. Each design intervention generated questions, interests and included topics that would define the foundations for the next. These links between interventions allowed her to keep exploring her initial questions and guided her towards presenting alternatives to our current educational systems (Figure 7).
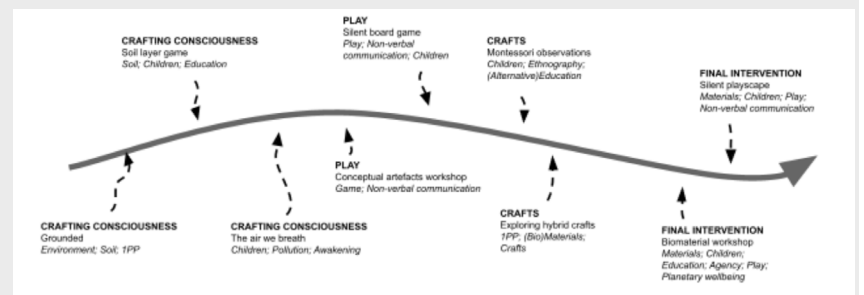
▲ Figure 6: Morgane Sha'ban's 'Silent playscape' intervention (above).

▲ Figure 7:Morgane Sha'ban's serial drifting in futures scouting representation (below).

PoliMi PhD project

GROUP: 1

YEAR: 2021

TEACHER: Manuela Celi

STUDENTS: Annalise Kamegawa, Caterina Regni, Christine Lunglang, Elena Guaraldo, Giovanni Pastoressa, Joshua Seckerdieck, Julian De Freitas, Mei Du, Valentina Giulietti, Yanhang Jin

TAGS: Agency. More than Human. Nature. Time. Rituals.

Ritual Gloves and Skin Food

On the one hand, Ritual Gloves is a DIY cult object that resulted as a response to climate change and natural disasters that caused many world's regions to be flooded. This object brought the cult members closer to nature after the biodiversity loss, by facilitating pollination rituals. On the other hand, Skin Food are three products that replace the experience of eating by satisfying all five senses and guaranteeing a sense of satiety, saving time while still being nutritious.

The importance of creative and critical readiness

All in all, we need to engage in shared acts of exploring and envisioning readiness, that is an anticipatory design readiness. This is a readiness that is characterised by being supple and reflexive, agile and adaptable, creative and critical. However, attending to the immediate and urgent needs a longer term stance, a deeper set of pathways and activities to transformational knowing, and durative means to realise lasting and substantive change.

In this respect, we refer to the need for what we call a 'critical readiness' that is more than developing a preparatory sensibility towards accepting a need to change our design pedagogies and profession in the face of climate change.

'Critical readiness' is a capacity to be able to adopt positions of deep and meaningful response in order to effect change and to see it through. This will, of course, demand rapid and perhaps radical changes in our stances and positions towards design and learning in the present and very near future.

However, 'critical readiness' also demands we look closely and carefully at work underway that has the power to reposition our pedagogical and productive agency in learning to be better positioned and exercised to avoid being simply swayed by assumed practices and functionalist responses to needs and to following trends and technological developments, as if there are merely natural, neutral and normal, rather than bearing illocutionally performative force and directing un-reflected and even repetitive implications.

How though are we able to enact and sustain such claims and projected pedagogical practices? At AHO, for example, work on ship bridge design, multimodal interfaces and safety critical matters have been developed over the past decade to position and integrate interaction and systems design in the maritime sector in which weak coordination and intersection of diverse suppliers has itself needed to be overcome as a design problem.

This work has included taking on the fact that the maritime sector is a major global and unregulated fossil fuel carbon emitters. Innovating in this massive sector of global transportation and trade and building designerly participative partnerships has given a design based buoyancy to this sector that has made it possible to move into every serious need for its fossil fuel dependency to be transformed through the ongoing design of electrically powered vessels and actual design collaborations that put working ideas in action in workplaces. In 2022, for example, AHO design students took part in fieldwork on the busiest ferry route in the country right on the ship bridge and in contexts of daily work, including one of the electric ferries.
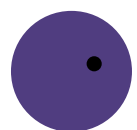
An anecdote for a generative, studied imagination

BY Jomy Joseph

EXCERPT FROM: PhD thesis, Jomy Joseph (2023)

TITLE: Refuturing Studies: Rehumanizing futures through/by design

SUPERVISORS: Prof. Håkan Edeholt (AHO) & Prof. Bodhisattva Chattopadhyay (Univ. of Oslo)

The following anecdote is meant to offer a glimpse into how the studied imagination, observation, and experience in fabricating these artifacts have assisted in my world-building. On numerous occasions, I had to travel to buy a single screw (Figure 8, right), this was quite frustrating, but over time, I would let the speculative mindset take over and continue the process of world-building where this problem would be solved.
So, for a screw, say, it might be a matter of production, consumption, and distribution. I wondered about logistics and started negotiating with the diegesis—what conditions would enable the fulfilment of material needs in a fossil abolition context; what might happen if the global supply chains that rely on fossil fuels today were different; how different might they need to be? What would the conditions be for specific technologies, socio-political movements, economic systems, and ecological shifts emerging from this world if the world were serious about tackling climate and ecological crises? Would a screw be any different if this happened?

This is better illustrated by reconstructing an internal self-conscious world-building dialogue, as I often found myself doing when making trips to the hardware store for that solitary screw. It went something like this:

"What would an extraction policy be for resources to be produced, who would care for the material processes, would they be extractive, or would they be persuasive like the neolithic practices? Would they be sustainable or ecological destructive? Could there still be toxic materials used in manufacture, or would it be reasonable to apply them in low quantities? Who would care for the materials that get made? Would it be enough to satisfy needs? What about desires? Would economic policies reflect that fulfilment? How would people enjoy this process in the process of participation? What social or climatic conflicts might emerge, and how might they be tackled? What conditions of needs fulfilment would allow for that, that may also become sites of social play? Would we still need experts? How would new knowledge get produced? Would these sites of new knowledge disseminate knowledge? Would journals still exist? Would predatory journals or patent trolls still exist? How would this new knowledge get produced, what would be a research program that allows for that, and how would it affect the development of a technological culture if some cultures went about pursuing it or not?… What would the world need to be for this to be the case?"

…and so, it unfolded…

The point of this self-conscious speculative exercise is to suspend disbelief and imagine and embody the possibilities of moving between P1 and P2 in the here and now through design and designing. Thus, this diegetic logic would then be backcasted to today to understand the conditions for which the fictional future research would be 'true' as imagined and the prerequisites for which it would be possible to fabricate these artifacts differently. Thus, the speculations were being reflected, diffracted, generating what-if questions of their own and being backcasted from such that whole material ecologies could be speculated. This required that I suspend disbelief about the changes and allow for the constant unfolding and the places it might lead to, as seen in Figure 8.

This is a cognitively tumultuous process, as the knowledge and solution spaces are unstable and constantly moving, even though thematically fixed. Moreover, this only describes the internal dialogue of the process, not accounting for all the other external conversations and experiences that shape the holistic approach. Nonetheless, these are thought experiments in action, grounded by the most relevant studies I could find that either verify or discredit the presupposition or generate more what-ifs. Undoubtedly, these questions can be asked by anyone if one can find enough factoids about the world. Although doing it well and being critically conscious of what is being imagined requires practising a studied imagination. That is why designers use many creative strategies to manage and develop their processes. One is, after all, dancing with ideas.

5.
Towards Transformative
Long-Term Resilience

BY Andrew Morrison
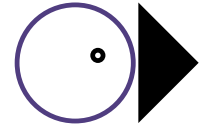
Making embodied relations

Realising such anticipatory design futures literacies as readiness is possible in our view when literacies are understood and practised as mix of capacities and capabilities, fluencies and expressions and engagement and vibrant matters of use. They need to be engaged with embodied relations between materials and performances between human and non-human, technological and systems, services and uses, and as artifacts and articulations where trends and directions may be transformed. In doing so we will need to explore, support, embed and critique shared practices of shaping long-term anticipatory design resilience. Without attention to these propositions and principles and their relational practices of critical and creative making, we will not be able to work in, with and through designing itself to enact responsible, care-ful and meaningful societal and planetary change in which design is a potentially key player.

We will need to generate new scenarios and schema of use in shaping contexts in collaborative future making, by students, in teams and individually, and whether as lone designers of community or company situated making. New scenarios may seem remote from earlier modes of design as product generation, being political or immaterial, ideational and proto- and provo-typical projections and temporary crystallisations of possible, not necessarily actual futures. These will be human-non-human futures, as shown by the projects from PoliMi students here [→ SEE **FEATURES 8**]. In these contexts, students will need to work in an anticipatory design mode to interrogate and to continue to critically assess and appraise the futures we explore and offer and propose. They will engage in self and group critiques and they learn together, as much as though the end of studio or semester external appraisals.

Radical hope and inner selves

While hope is needed in keeping agency in anticipatory design motivated and active in its making, this is not simply transactional. An anticipatory design agency will need to be fuelled by radical hope (see the FUTURE PHILOSOPHICAL PILLS) that helps students and teachers to be open to the possibilities and constraints of pushing into and beyond the ephemeral and the seemingly disruptive. This may be achieved by cooperative knowledge making in a form of shaping ethnographic design futures, not only studying them. Students may take up props, scenarios, briefs and working provotypes and reconsider and reposition them in processes of engaging participation. Together, such processes and practices of finding not simply aligning with, agency that is emergent

and itself invigorating ought to work to further inform students' ongoing design futures literacies of shaping shared futures and making the prospective actual.

However, agency is also often diluted by a sense of overwhelming odds beyond the scope of students' control as we have seen in the challenged in shifting to remote pedagogies under the pandemic. Motivating and facilitating agency on the part of teachers and by design students in processes of event-ful learning are challenging when they are also about futures [→ SEE **FEATURE 9**]. In such settings and their often-entangled pathways around negotiating the contingent and the fleeting, complex systems relations and uncertain change processes, hope is all too easily frayed. Distrust may be shown and futures may seem even cloudier, so active 'hacking' futures matters.

Our experiences as students and teachers have shown us the importance of understanding our inner selves, affectively and psychologically and relations to developmental (Lund & Vestøl, 2022). This concerns working with futures but equally working in time of crisis and change where givens and indistinct prospects become deeply contradictory. Here the dynamics between our personal, mental health and wider societal and institutional organisational health (Grof, 2000) may veer away from one another, even collide and have and will be in need of alternate modes of support by our design universities and colleges. Czerniewicz et al. (2020: 964), writing on the demands and constraints of providing Emergency Remote Teaching and Leanring (ERTL) from a multi-country view, point to a larger ethical and structural needs for equity of our design futures pedagogies to be genuinely anticipatory. They reflect that:

> *On a personal note, we are still hopeful, we cling to hope, although we know that this hope is fragile. It is also an angry hope, because we, as with many of our colleagues, are at the forefront of this pandemic and are dealing daily with the impact of the glaring inequalities our society and our institutions are steeped in. Hope sometimes feels wrong, in particular when we feel we are supporting a broken system to survive with our feeble attempts at saving the unsavable. Hope feels torn, because we are uncertain of what is right and what is wrong. Hope is dogged, because we nevertheless continue our work on a daily basis. Hope is resilient and collective because as communities, we do find ways to cope, but hope is also compromised because we know with every move we make to support some, we leave others behind. Hope is critical because we keep calling out systemic injustices, but hope is also insistent because it is impossible to give up as long as possibilities exist for equity-oriented change.*

How then are we to move from the pressures and vagaries of learning crises, learning in crisis and learning with crisis? Again, recent writing in educational research provides design with frameworks with which to address such issues and to develop suitable and situated practices for shaping anticipatory teaching and learning through design.

Agentive learning for today's tomorrows now

Referring to Galperin's concept of teaching-learning ('obuchenie' in Russian) as framing a transformational activity view, Lund and Engeness (2020: 5) argue that '... the dialectic constituents of learners' agency and appropriately designed digital artefacts can

unleash educational practices with genuine validity for the 21st century that have a firm basis in the cultural-historical perspective.' Focusing on digital tools, materials and mediations in research on writing processes and a digital tool, that they reflect on learning and teaching within activities of transformation that shift between world and mind, concerning time, recursivity, conditions of mediation, awareness of tasks and purposes and facilitation. They note that Galperin's work has received increased attention in recent years as providing elaborations on earlier work in CHAT by Vygotsky and Lieontiev (e.g. Lund & Vestøl, 2020). Galperin's work remains to be fully applied within design-centred pedagogies and futures-oriented ones in and outside design. 'However, how such potential can materialise in educational settings needs careful co-designs and extensive collaborative efforts of professional teachers, students, and researchers.' (Lund & Engeness, 2020: 5). Further, it reveals students learning for themselves, and with and by themselves in increasingly self and collaboratively developed and re-directed activities as central to transformative design futures pedagogies.

Design students work with sociocultural, bio-technical materials and affordances and resources. They repurpose, alter and revisit aspects of processes and non-linear as well as sequential production, whether in DIY or parametric frames. They constantly engage in shaping new forms, functions, communication and experiences that also embody and propel their own learning and its revisions and renewals. Lund et al. (2019) discuss transformative digital literacies agency and that ' … agency is not an innate disposition in the individual; it is developed in artifact-mediated and object-oriented interaction' and that '… we increasingly come to knowledge by engaging in extended, embedded, (and embodied) cognition'. (Lund et al., 2019. 50).

The implications for an anticipatory design suffused with agentive teaching and learning are that transformative agency is a both about the construction of new mental processes but also their materialisation in the multimodal, mediational forms, processes, interactions, services and systems that design works to materialise, share, communicate and change.

This points further to the need for design futures literacies to elaborate far more fully on the role of mediating artifacts and artifacts of mediation, connected to social and inner concept development, criticality and articulations of processes of making and unmaking given and to look more deeply into the world views and discursive and multimodal means through which design futures are shaped and analysed, as our PILLS and LEXICON work to explore ontologically and generate via interplays of designing and reflecting. These are entwined with and transformed epistemologically through the tools, means and mediations we take up in our project, together with ways stretching, reconfiguring and rethinking content and process relations and ways of engaging users and participants in activating and pursuing their own agentive transformational literacies, as we call them.

These are crucial matters for themselves as young learners and future citizen designers and researchers, and for their own personal and interpersonal intentional, exploratory and emergent anticipatory learning and knowing.

PoliMi PhD project

GROUP: 4

YEAR: Manuela Celi

STUDENTS: Sebastiano Zaniboni, Shahla Bababayli, Malgorzata Postrozny, Jing Zhang, Beril Kucukbeydag, Mariana B. Firigato, Innocenzo De Risola, Wangpeng Zhou, Fujun Wang

TAGS: Knowledge. Community. Competition. Survival.

Anja

Facial wearable device, Nosecam, functions as a third eye that commands, perceives, and monitors the tasks being performed by the user, giving advice on how to execute them correctly. Completed by another product that projects the analysed data from the tasks performed, with daily scores and rankings being displayed around the city, aiming to foster adequate and survival practices amongst the community.

Hacking Futures – Futures Hacking: Reflections on co-created futures

BY Silke Lange

BLOGPOST: Futures Philosophical Pills

AVAILABLE: Link ↗

At the beginning of February 2020, we, the UAL team: Betti Marenko, Pras Gunasekera, and I, facilitated a workshop with Masters students from across UAL. Earlier in the year, we had sent out a call to our postgraduate student community, reaching out to various disciplines, with the aim of creating a transdisciplinary learning environment, in which practices of exchange and interaction could inform our ongoing research for Fuel4Design. Following a positive response to the call, we selected a group of 22 students from subjects including: material futures, art and science, innovation management, and applied imagination. Hacking Futures – Futures Hacking was ready to go!

The collaboration with students has been a priority for us in this project. Developing, testing and implementing new approaches and resources without students' input would simply have been wrong. After all, we were aiming to equip both learners and educators with innovative and adaptable tools to imagine, perform and enact a plurality of futures by design. This process had to be led by co-creation.

The relevance of co-creation in higher education is not a new concept, and has previously been highlighted by Chemi and Krogh 'for a future that needs to strengthen human relationships and practices of sharing, the ability (or disposition) of creating a shared value in spite of differences is strategically fundamental' (2017, p. x). In a world in which diverse cultures, disciplines and generations have to come together to meet challenges we don't yet know of or understand, collaboration and co-creation is crucial. Teaching and learning methods that served the age of industrialisation are no longer relevant and need to be replaced with approaches that recognise the value of positionality, empathy and multiple perspectives. The Philosophical Pills to be tested in the workshop were precisely facilitating such an approach: affording a lens through which students could take a renewed look at their design practice. Pills such as Speculation,

Counterfactuals, Heterotopias, Divination provided different ways of thinking about the future.

Hacking Futures – Futures Hacking created a space for philosophy in action, with the architecture of the workshop space inviting students to engage in a number of activities. These included a silent brainstorm exploring questions such as: How do you imagine futures through your practice? What do you see? What concerns do you have? What issues? and 'Futures' collage building – think in images not words (Fig. 1). We engaged in collective sense-making and individual reflection. Instead of reproducing knowledge, students were encouraged to co-produce knowledge – the pills are an accelerating tool for such processes – encouraging knowledge exchange and knowledge co-production.

We were using pre-designed templates to guide the process and encouraged students to populate a Padlet wall (Fig.2) to create a virtual exhibition of their findings and key stages in their development process. The workshop was full of energy, intelligence and creativity – all of which fed into the approach and tool we were testing.

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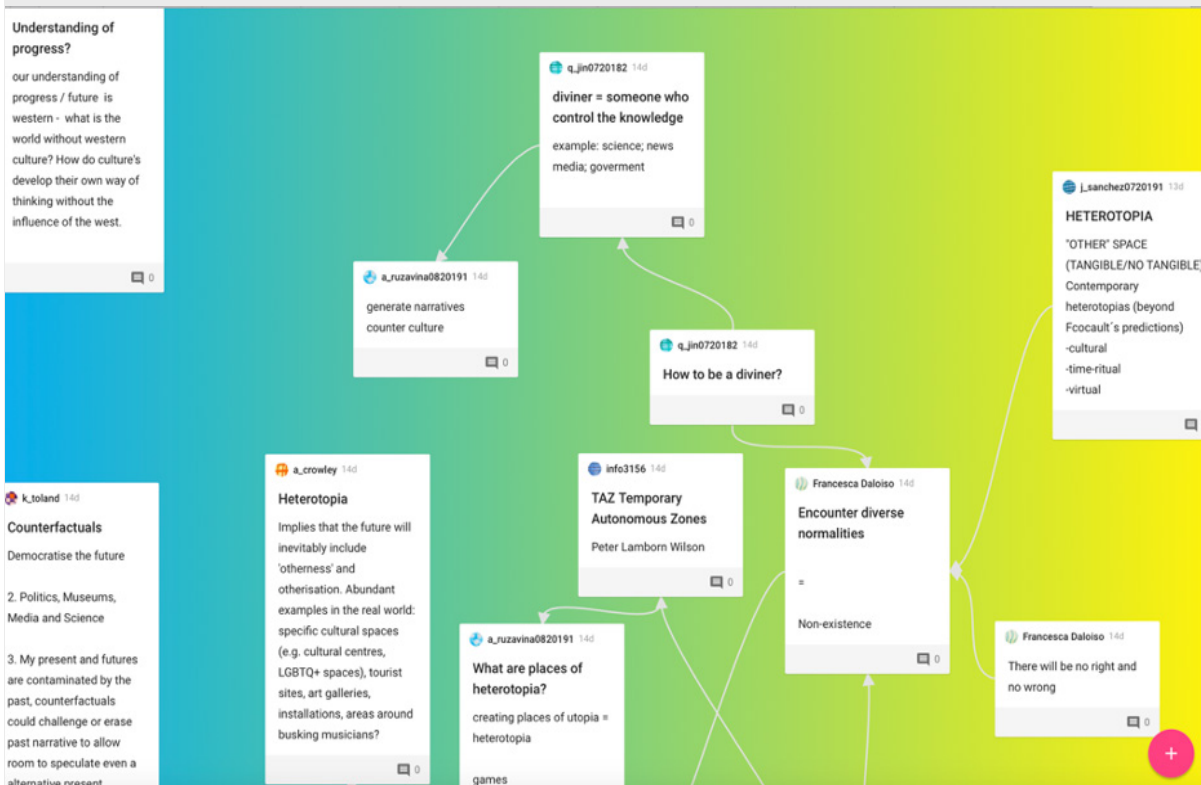
▲ Figure 2: Padlet wall displaying virtual exhibition of process and students' findings.

During the evaluation of the workshop, students expressed their appreciation of having been able to participate. They very much valued the approach we had taken – for students, the workshop has been a new approach to teaching design, not only the tools we are developing as part of Fuel4Design. According to students, Hacking Futures – Futures Hacking provided a learning environment in which they were enabled to: share concerns, feel nurtured, enriched and empowered, develop collective understanding, connect their values, no longer think and make in isolation, find a common language, and create a community.

I am writing these reflections almost one year later, in January 2021. Shortly after Hacking Futures – Futures Hacking, COVID-19 began to spread across the globe,

interrupting the way in which humans interact. Workshops, like the one described above, in which the physical proximity between the participants contributed to building trust and created the sense of community students were yearning for, transitioned online. Face-to-face, in-person meetings of any kind were postponed until further notice, and travelling between countries was restricted to essential purposes only. Unexpectedly, the very future of the Fuel4Design project itself had to be reconsidered. We had to turn the imposition into an opportunity, embrace the challenge and learn how to collaborate and co-create whilst socially distancing.

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Refuturing Studies: Re-humanising futures through/by design

BY Jomy Joseph

EXCERPT FROM: PhD thesis, Jomy Joseph (2023: 135)

TITLE: Refuturing Studies: Rehumanizing futures through/by design

SUPERVISORS: Prof. Håkan Edeholt (AHO) & Prof. Bodhisattva Chattopadhyay (Univ. of Oslo).

THE WALEZI WA MSITU

Guerrilla Agroforesters of the Mombasa Climate Resilience Zone

Climate Resilience Zones (CRZs) first emerged in Mombasa as practised by guerrilla agroforesters. They use forest seeding devices that make 'seed balls' that use a carbonised biochar medium 'supercharged' with biologically sourced nitrogen and phosphorous and inoculated with selective mycelium spores native to old-growth forests. The mycelium aids in re-establishing healthy root-soil microbial relations, enhancing the availability of nutrition, and rejuvenating the soil microbial health for these old growths to flourish. These seeding operations are spread in randomised patterns using 'creative' and resilient forms of seeding old-growth forests for faster biodiversity recovery with the forest seeders. Over time, these CRZs regenerate the terrestrial ecosystems, complementing conservation efforts, including biomass production from agriculture and forestry, storage, filtration,

▲ Figure 26. Guerilla agroforesters gathering to embark on establishing the Mombasa Climate Resilience Zone (2064). Concept Illustration: Author.

and transformation of nutrients and water, biodiversity habitats, ecologically sourced material resources, and carbon sinks for a long carbon drawdown. On a long enough timeline and with its global reach, the development of CRZs starts to blend into each other, eventually transforming into Pan-Indigenous Autonomous Zones.

Reference

'Becoming Terrestrial: Of Climate Resilience Zones, Symbiotic Fabrication and Ecosystem Regeneration'. in *The Open Journal of ReFuturing* (2131). Chapter 2: 549.

6.
Agency Fuels Design Futures Literacies

BY Andrew Morrison, Manuela Celi & Oscar Tomico

Making with... holding onto utopias

As the physical and political effects of design become explicit in social injustices, geopolitical struggles, and climate change, there is simultaneously confusion about which agency really matters in which context. As I design a shovel, and I negotiate the brief, the users and stakeholders seem to include everybody from minerals and worms, subaltern and disabled, laborers and users, miners and logistical workers, victory gardens and agribusiness, and somewhere far off, the client who will pay me for the work to make some more money. It can be confusing. But just because it is confusing doesn't mean we should discuss this only in the graduate seminars. Making, even if only simple models, can help us shift between several perspectives. (von Busch 2022: 17).

Design futures literacies are ours to make. To shape, to interrogate and to upend. They are ours to innovate and to explore, to twist and to transform. Anticipatory Designing offers us a non-universalist framing with which to assemble and sort, layer, link and work generatively and in nonhierarchical networks of situated activity. Our design futures literacies need systems-oriented designing in and of themselves and these systems need to work with human and non-human components, actors and ecologies of care and agency. They need to be reconfigured and repositioned, with a rich diversity of contributions and curiosity, as forms of meta-design that accentuate the holistic with intersections, that are transdisciplinary in their reach and arrival, that support modes of becoming where connections, collaborative knowing and contextualised and open dialogical modes of criticality prevail.

Harraway has given us the useful notion of 'staying with the trouble' (Haraway 2016). She motivates that we need to stay with the trouble of living and dying on a planet that is damaged and in need of alternates [→ SEE FEATURE 10]. For Harraway what's needed is a mode of 'making with' (sym-poesis), as opposed to one that is centred on self. Anticipatory designing needs to stay with the trouble of taking care ahead of time, but we suggest is needs to shift - creatively and critically - into modes of 'working with the trouble'. This positions 'the trouble' of content, climate, complexity and so on as design material and design artifacting and design communication. It demands of us action with reflection, and attention to matters of becoming through anticipatory designing.

What might such a becoming imply for futures design literacies and their pedagogies, and for the near and further-flung futures? Attention to care is what we see as a key

component of design futures literacies, namely literacies of anticipatory care through design. Joseph (2023) argues that we need in a mode of refuturing to hold onto and to actively materialise speculative critical designing in relation to utopias. As mentioned earlier, he does this by shifting a conceptual and pragmatic space for anticipatory designing in which care and agency are intertwined. Time, care and agency are closely entwined.

Here it is perhaps useful for design educators and researchers of design pedagogies to consider the recent writing of Stetsenko (2020) and her call for us to address 'the urgency of agency'. One brewing theme in our contemporary techno-design world is that of Artificial Intelligence (A.I) [→ SEE FEATURE 1] in which making is already being ascribed to massive language machineries, data-driven composition and computational agency.

Much remains to be pursued by design educators and researchers with students and other professionals in working with relational pedagogies with technologies and platforms such as ChatGPT. Since beginning writing this chapter, we see an explosion of interest and concern about agency in student learning with such seemingly human software mimicking, assimilating and representing otherwise human intelligence and agency in writing and visualising - and composing more broadly. Our design futures literacies have thus become even more complicated as they stretch notions and practices of generation of learners (Spiers, 2022) and notions of authenticity in student learning (Vernon & Paz, 2023) and complicate even recent writing, such as Tiernan (2022) in an article entitled 'Gently down the stream(ing): Can digital literacy help turn the tide on the climate crisis?'

Design futures agency, positionality, systems & power

In *Care, Uncertainty and Intergenerational Ethics*, Groves (2014: 25) writes that:

> … *the nature of our relationship with future people is key to understanding future-oriented obligations. The social experience of reflexive uncertainty leads to an immanent critique of certain assumptions, widely held within technological societies, that have helped the uncertain future to be epistemologically and symbolically domesticated. The ability of people alive now to shape the future through collective, technologically aided action connects the present to even distant future generations, yet their inability to understand what the effects of their mostly unconscious exercise of their power will also be separates them from these future people.*

As designers, design students, design educators and design researchers we might need to give more space to partly finished processes and works, working in dialogue with others to continue to expose how anticipatory design may help fuel our futures literacies in which other specialists, participants and users will be present and vocal. This too will mean we will need to reassess matters of positionality and power (see Part IV, Volume 1) as part of creative-critical, and even intermediate, acts of shaping shared futures.

This may be realised by finding out how anticipatory processes may be understood as world views in their own right and how we might give energy to them as once the Bauhaus committed to modernist principles and built foundations for design education that permeate our institutions a century later. Yet, there is still something alarming here, not only about sounding alarms but about how design needs to connect its specialisations and to work more systemically and critically as a whole, with difference and depth (Sevaldson, 2022). We too often meet colleagues, courses, and research projects that take on societal needs and comply with strategic goals and programme-level issues and frames but these are typically not required to address long-term change processes.

These changes demand long-term thinking and strategies that will need citizens and consumers, company boards and shareholders and policy-makers and political machineries to immerse themselves in scenarios and consequences, fewer arguments and scare mongering or dystopian near futures when only deep change will actually suffice, within the small critical window we now have available. There is an acute, not only urgent and precarious, anticipatory design space available to us as design educators without whom our own changes cannot pose key means to achieving not just careful but 'care-full' transformation ahead of time.

We agree with Aagaard and Lund (2019) and Lund et al. (2019) that futures design literacies, similar to their take on digital ones, ask that we engage actively in reconceptualising agency and change in learning. On anticipation Poli (2022: 139) writes:

> While futures literacy is still in its early stages of development, it is clear that it can greatly increase the social ability to 'see' the future – in the same way that reading and writing have increased people's capacity for citizenship. Under no circumstances is the intention to 'know the future;' rather, it is a question of allowing people, organisations and communities to make explicit choices between different possible futures…. The challenges we face in the coming decades will require citizens to be increasingly aware and able to make important decisions; in this sense, futures literacy promises to be the necessary basis to arrive, perhaps, at shared choices.

This too is a matter of seeing agency at different levels and in relational design discursive dynamics between teacher and students, learners in shared meaning making and individual inner and externalised articulations of learning in and as transformative. Here design futures agency is anticipative (Poli & Valerio, 2019): it is plural and dynamic, and also complex in its settings, mediations and enactments as it has become a mix of digital-hybrid-physical. Lund et al. (2019: 48, original italics) remind us that:

> Digital technologies make it possible to expand educational repertoires and break out of the status quo. This is not technological determinism, as transformation depends on human agency. In education, this entails designing agentive tasks and assignments that require students to take action in order to make sense and syntheses of multiple sources and representations.

Keeping fearlessness alive

In continuing to work with framing and shaping agentive tasks, activities and spaces for students' productive and critically creative designs and articulations through designing, learning and pedagogies, as design educators and designer-researchers we will need to communicate pragmatically and analytically. In addition, this needs to be extended to dialogues with our more technical university colleagues, as well as to businesses under pressure to adjust to a pandemic and to global economic instabilities.

We ourselves will need to be open about our own practices and how we feel and work with change. We will need to do this as educators as we engage in designing anticipatory design learning.

We close with a quote from Bozalek et al. (2018: 119) that reminds us, as we covered in Essay 2, that in supporting and facilitating futures in design education through designing, we need to keep on learning how to learn and work together relationally but also fearlessly:

> *We acknowledge the inherent risks as we each experiment with different encounters, attempting to involve ourselves in ethico-political spaces that have opened up in our teaching events. The emotional labour in working with unjust practices is challenging, within a context where humans and non-humans are treated as discrete unrelated entities. Still our teaching strategies ought to promote fearlessness. In writing together and apart we help each other become less fearful. Reconsidering our teaching and research practices, we have all felt the tensions in shifting from traditional individualistic approaches towards making relationships matter in a democratising manner. In our becoming-with students, stories, learning materials and socio-political events, we have needed to and continue to adjust our thinking and doing to patterns of relationality.*
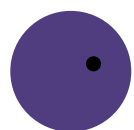
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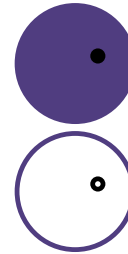
LEARNING DESIGN BY MAKING FUTURES

BY Manuela Celi, Andrew Morrison, Oscar Tomico & Betti Marenko

WITH Ammer Harb, Silke Lange, Guim Espelt Estopà, Jana Tothill, Roger Guilemany, Mariana Quintero, Corbin Raymond, Yue Zou & Jomy Joseph

1.
ORIENTATIONS

BY Manuela Celi, Andrew Morrison, Oscar Tomico & Betti Marenko
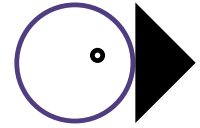
Introduction

Uncertainty, contingency and indeterminacy

Working with design centred and futures-oriented literacies necessitates close attention to processes of making and knowing through designing that are well located and exercised in practices of observation, participation, documentation and distribution [Figure 1]. In FUEL4DESIGN we have sought to take up and try out tools and techniques from design and Futures Studies and to actively make new devices and engages in online platforms, physical artifacts and embodied communicative affordances. The global pandemic meant we simply had to work far more online and then later in a hybrid mode than originally planned. Consequently, we found ourselves in were often demanding, challenging but also rather stimulating design learning spaces and processes of making literacies by designing. Ironically, these were spaces that were filled with tensions and new needs, yet they made far more explicit what were otherwise tacit aspects and assumptions of our ways of teaching and learning - and also designing. Online collaboration affordances, digital materials and distributed communicative engagement needed to be sourced, arranged, activated and assessed en route, in flux and by way of exchanges of expertise and experience.

In FUEL4DESIGN we have aimed to work in uncertain times and to see uncertainty as a design material of sorts. In this pursuit we have built a relational anticipatory epistemology via design pedagogical experimentation, practice and reflection. In this chapter we take this up in looking further into learning design by ways of making futures. This continues our work presented in earlier parts of the book and in other essays here into situating futures critically and creatively in shaping futures by making through design pedagogies in which human and non-human across, systems and agencies co-exist (e.g. Snaza et al. 2016; Snaza, 2019). These have come to the fore as philosophically speaking, in addressing relations between the physical and virtual, we have needed to pedagogically address matters of uncertainty, contingency and indeterminacy (Marenko, 2015).

Heightened then, were our well-worn ways of working. In their being exposed in more than a few instances, we would come to see, and need to look right at and respond to, their structural and systemic constraints and tensions. We would need to do so along with the ways these were in processes of being reframed but also reproduced without deeper or durative futures informed or reaching responses and even preferred arrivals.

Pressures in the present

Our designing and researching, through our pedagogies and related engagement, at personal and group levels, could not but acknowledge the effects of design's own historical makings, as fundamental aspects of global living, ethics and learning were made manifest. For some of us, teaching and learning seemed more entwined than previously; we were all now learning together how to live and work in the context of increasingly compounded crises [→ SEE **FEATURE 1**].

Daily news, our changes practices of movement and social relations under degrees of lockdown, the role of atmospheres in public spaces, of healthcare and delivery systems and policies all worked to make us look into and reassess what methods and tools were at hand, which ones arouse and worked and perhaps most importantly of all what might be needing to be designed and studied. Making a difference to contexts and conditions of crisis seemed to be unavoidably a matter of critically assessing, enacting and evaluating what might be done, could be done and ought to be done. All in all we became engaged in wider, collective prototyping within, between and across our personal, professional, institutional and disciplinary design domains and their transductive means and methods but also beyond them, as is taken up by Roberts-Smith et al. (2021).

> How might methods and learning be taken up and realised together in our experiments in a design futures literacies orientation and co-contribute to their formative critical practice and the exposure of new needs and possibilities?
>
> What potential might we reach towards and be surprised by as emerging through our activities and gaps between and beyond them?
>
> Would our approaches and methods be sufficiently reflexive in reviewing and revising and even replacing what was developed and trialled?
>
> In the context of crisis, change and complexity, might we need to delay and deflect assumed positions and practice, allow them to disrupt, divert and disturb surety and complacency as means to making design futures literacies differently?
>
> Joining the dots, making distinctions and connections, refining relations and exploring options would need to be a part of our wayfinding but who and how would we do this, in different domains of the project and between and through them methodologically?
>
> In placing our attention on teaching and research methods and to design techniques and tools in making would we be able to look beyond design's conventions and boundaries yet remain selectively critical and intentionally aware of the choices and effects of methods drawn from other domains and disciplines?

In all of our shared and individual pursuits and students and teachers, we would need to be creatively critical of which methods do what work for design on futures in contexts of multiple, overlapping and compounded crises, we would engage in a diversity of mediational means to exploring design futures literacies in an increasingly complex, changing and uncertain world. We would need to remain vigilant that our working with

methods would take up these challenges pragmatically but also critically and not merely become defensive, directives for shutting down difficulty and diversity and engaging proactively in accessing a range of approaches and devices for decolonising methodologies and methods in design, as a domain and via education for professions and informative research, we would be implicated in how design praxis and analysis shape futures and how futures may be colonised, occupied and limited by design.

These are no small challenges. While they apply to design education generally in a changing world, they would need to be about futures, located in an anticipatory design pedagogy in the making. They would be flipped and frayed, altered and propelled outwards and upwards, not forwards only, with and without acceleration, sometimes shifting slowly and waveringly, at times bouncing along, uncomfortably but enthusiastically, expressed and realised with verve and vigour.

Forging futures knowing through design learning

The essay has contributions from four of the PhD students linked with the project and using our resources and attending and contributing to our events. Their work in this essay covers relations of making design futures through designing and analysis, methodologically and in terms of methods. This refers to research methodologies and methods and to design tools and techniques. The focus in this chapter is on the former two (see FEATURE 1).

These are designers who, during the project, have been learning to become designer researchers, and their contributions to this and other chapters is indicative of a clear contribution to FUEL4DESIGN by doctoral students from the Global South.

Refuturing Studies: Re-humanising futures through/by design

BY Jomy Joseph

EXCERPTED FROM: PhD thesis, Jomy Joseph (2023: 126)

SUPERVISORS: Prof. Håkan Edeholt (AHO) & Prof. Bodhisattva Chattopadhyay (Univ. of Oslo)

FIREFLY

Autonomous Forest Seeders deployed at Regeneration Festivals Over time, Climate Resilience Zones (CRZs) get expanded using autonomous seeding devices called Fireflies. The citizen science groups in the Hong Kong CRZs, inspired by the *Walezi wa msitu*, take the concept of old-growth ecology seeding to the next level with automation practices that are also more useful where more delicate regeneration strategies are needed. These autonomous seeders are cheekily called 'fireflies' in a period when the insect decline coincides with continued 6th mass extinctions. Under exacerbated and unpredictable climate cycles, these assisted seeders offer the possibilities for migrating and regenerating vulnerable terrestrial ecosystems to suitable climate ecosystems through zones by restoring soils and freshwater.

Human efforts in the various regeneration festivals that have become widespread. In the 21st century, these 'fireflies' are busy planting new old-growth ecosystems in regions where the heat death of forest ecosystems has occurred. However, this is only done under desperate attempts to preserve biodiversity and relieve these ecosystems of climate stressors, as disruptive climate patterns disrupt ecosystems worldwide.

Their contributions are located in shaping and refuturing product design and sustainable futures (Jomy Joseph, India), by means of communication and speculative design and consumerism (Yue Zou, China), through attention to methodological diagramming and futures-systems views (Corbin Raymond, South Africa), and in relation to critical designing methods as and a catalyst for change (Ammer Harb, Egypt).

Outline of chapter

Inside the bookends of an Introduction and Conclusion, this thematic essay is arranged around core activity and making components that we have arrived at as topics of central importance in addressing matters of methods and tools and design futures literacies. The topics are as follows. Section two covers 'Making, methods and futures pedagogies'. In section 3 we take up 'Developing perspectives on making and methods'. Attention to 'Making futures design literacies material' is the core of section four. Section five moves on to 'Re-positioning speculative designing'. Finally, in section six we explore and 'Realising actions, activities and hopes'.

As across the globe we needed to adjust to the complex of pressures and uncertainties, at local and global scale, established practices of teaching and researching by design would be activated. Yet, in the context of complex change and futures needs, the limitations of embedded values and structural provisions propelled the 'what if' of inventive methods and speculative design inquiry.

In our project, this transpired, logically and emotionally, as we needed to think beyond immediate, and narrow perceptions of deep systems level framings and policies. We offer suggestions, not cures in the material below and this is intended to suggest rather than to declare. We present them to stimulate further thinking by colleagues near and far and to look onwards and upwards in a mode of a design futured education and potential for meaningful action in design futures matter together with vigilant historiographies and pragmatic, critical presents.
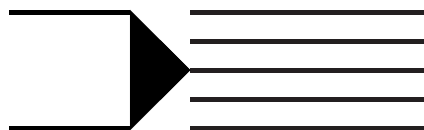
2.
Making, Methods and Futures pedagogies

BY Manuela Celi

Devising pedagogical guidance

In trying to understand methods and tools, we were very interdisciplinary in our workings. We dug into Design, Futures Studies, Foresight (e.g. Celi & Zindato, 2014; Hines & Bishop, 2015) and into more ethnographic, narrative and media approaches in design inquiry (e.g. Rudkin, 2014; Johnson, 2011). The idea was to identify, become familiar with and position selective elements and to borrow or draw forth some of these into a reconfigured set of tools and methods and their wider ecologies of learning, design and use. In IO4 the FUTURES DESIGN TOOLKIT, the intention of the project was to draw on perspectives of seemingly functional, procedural and performative devices and their related practices. However, we would need to develop our own design futures literacies views or perspectives on design methods for futures- related design pedagogies, as in IO5 on FUTURES LITERACY METHODS.

That said, in developing the FUTURES DESIGN TOOLKIT, there was a need to also make a survey of a huge volume of futures and design tools (see also Zindato, 2016). We used dialogues about what it was that they constructed and positioned and read them critically as to what they might be able to do and what we might be able to get them to do in a design futures view.

In proposing a wide selection of these tools, we were facilitating a process of understanding these tools for our community but also asking that we consider different positions to ones we had already taken. Allowing tools from different professions to be available in a design framework operated like a multiplier of the possibilities for other teachers not only learners (see Deserti, 2015). Our aim, therefore, was to enable other teachers beyond our team to multiply their own perspectives – and thus possibilities.

In this focus on methodologies, methods, techniques and tools, we see Design and Futures as meta disciplines (Celi, 2015; see also Essay 8: Tools, Means and Mediating Design Futures). This was apparent in the multiple cross-project collaborative contributions to IO5 on FUTURES LITERACY METHODS [→ SEE **FEATURE 2**].

While in the section below I focus on specific methods, tools and techniques, methodologically we sought to transcend attention to specific items or processes and to engage in explorations and work towards offerings of experiences of a shared shaping of meta knowledge frameworks - and means to realign and disrupt them.

Figure 2 ▶
Indeterminacy and Pluriverse: Having picked up these cards the students group reflect on how to develop scenario for world-building. The 'Hacking Futures - Futures Hacking' Philosophical Pills workshop at Central Saint Martins, UAL, 7 February 2020. (Image Credit: James Bryant).

Making futures plural (by design)

One of the most recurrent errors one faces when encountering discussions on the future is that usually we are told to think that there is a single future. This depicts a primary forecasting assumption that the future will be an extension of the present. One of the reasons for such unidirectional thinking is that our personal responsibilities towards change will be and feel useless because the rest of society will continue with its current behaviours and pathways. In essence, as individuals we are dissociated from our role as catalysts for change, such as in working with the re-combinatorial dynamics of the FUTURE PHILOSOPHICAL PILLS [Figure 2].

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In contrast, F4D consciously chose to place its focus on methods (see I05) as a duty and a need to state our own positioning matters more than we think as design educators and researchers and as design students and collaborators. What matters is on one side an issue of responsibility (see play the Pollack game with its selection of a positive or negative view on futures, I04) and what is the influence in changing the future.

> *For example, at PoliMi on the master's course, initially many students were not keen on thinking they may change something. At the end of the course, however, there was a change of view that it indeed matters that designers change the world through making. Students need to understand that their making actions make a change. (Manuela Celi, PoliMi, Interview by Vlad Lyachov).*

Even if such a view and related actions are delicate or small, they may spread and make an impact and have some influence. We need to appreciate that small and unintended consequences may arise from designerly actions. The idea that we ask students to adopt this positioning makes it possible for them and for design teachers to try out and test the possibility of acting on the future. This is a design cognitive potentiality that is materialised in the flow of time so as to have an effect back into the present of re-making learning and the reality of potential action for transformation (see also: Volume 1: Part II, I03 and Essay 2: Altering Prospective Design Futures Pedagogies).

A second important point - both in designing processes and allowing the process to be reshaped in activities of designing – concerns that avoiding single future we need to be attuned to imaginative, and to be open about future alternatives (see also I03). This is a form of design based future material (see also Essay 3: Time, Design, Futures and Pedagogies). Accordingly, we want our process to be open, designable, on two layers. The first layer is an educational path. The second layer refers to a corresponding layer of design making and reflecting on the part of students.

On PhDs, there is a need to support learning to research but also learning so as to avoid falling into the same methodology and processes as already cast by courses and curricula. As educators, we don't see reproduction is going to be sufficient or anticipatory enough to overcome limitations and demands concerning the needs and contexts of futures inquiry. In contrast, what we see as needed is facing up to and becoming supple with engaging with demands reaching beyond the already established into new design spaces and tools/methods development.

Processes and methods in design learning ecologies

> *Considering that the objective was to open out the possibilities of methods and tools and shift from most probable futures to opening out the cone to possible and impossible points of view, one of the most important challenges was to keep the design futures learning process open in itself' (Manuela Celi, PoliMI, Interview by Vlad Lyachov).*

Seeing design futures literacies as ecological has been important in the project. In I05 on FUTURES LITERACY METHODS we selected tools suited to functions and processes of how

we make in design, bringing seeds of futures through into each making steps.
We also understood that if we wish to add criticalities to possible structures of design processes, we need to rebuild the processes and introduce both uncertainties in the process (changing a path, shuffling functions) and add critical elements. On the latter, there are three moments where positioning is crucial in the design process: initial positioning, use of PILLS in Unit 3, and in Unit 9 to reflect critically on the design processes and making processes [→ SEE FEATURE 3].

Figure 3 ▶
Individual and group work with the DESIGN FUTURES LEXICON. Master's students in product design at AHO a in an extended workshop with Nina Bjørnstad on abstract form giving and futures terms relations by Andrew Morrison. (Photo: Andrew Morrison).

One of the most difficult criticalities in building I05 was that of the freedom of the designers, users or different possible actors to exploit the materials assembled. We needed to leave space and options while describing the most important steps and connecting design functions. Originally, our idea was to have learning objects that could be positioned (not in unique ways) that contained descriptions of several possibilities. It was important to frame and shape specific ways of knowing and making about the future and embedding them into learning objects without specifying a precise order. These learning objects should be a sort of autonomous zone and with its internal coherence. Each learning object would thus have relations to others yet also offer freedom in combinatorial ways they could be re-shaped into different learning ecologies [Figure 3].

In related work on 'Investigating design-based learning ecologies' (Snaddon, et al., 2019), we refer to 'micro-ecologies of situated activities' (Lemke, 1997: 5) in which 'how we play our parts in these micro-ecologies depends not just on what the other parts do to us, and us to them, but on what these doings mean for us' (ibid: 2) and how our 'identity-in-practice' ilbid: 3) develops as a result through feedback loops. For us, 'Design-based learning ecologies are thus learning spaces where designing as doing, knowing and becoming for a student and others can be seen and understood to be relationally dynamic' (Snaddon et al., 2019: 6.4).

On the EDUCATORS' GUIDE in IO5

BY Manuela Celi & Ammer Harb
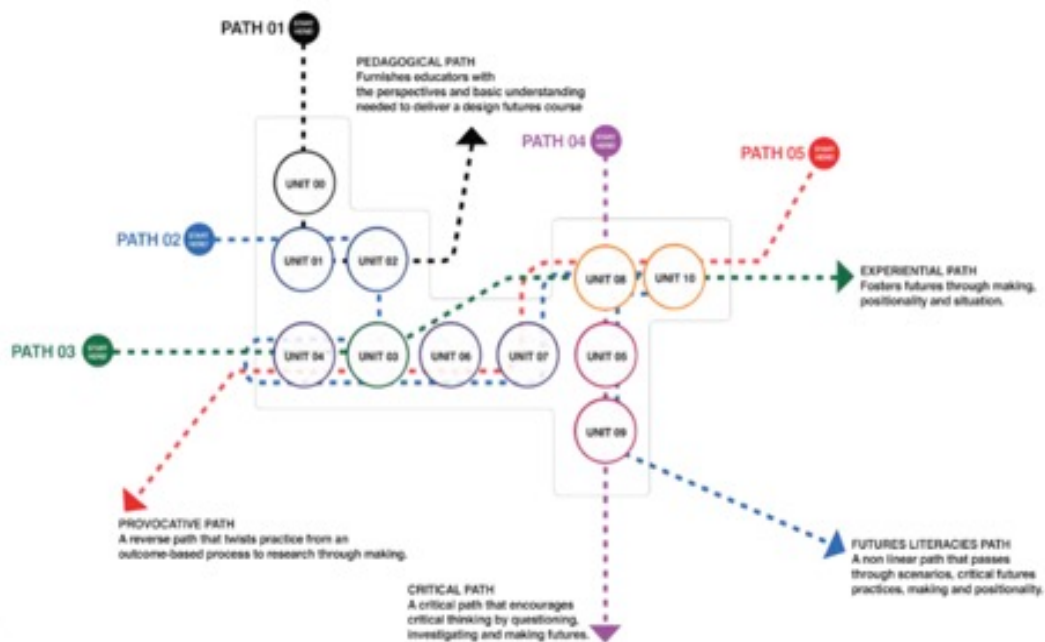
Orienting methods for educators, IO5

BY Betti Marenko & Silke Lange
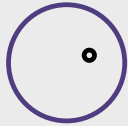
UNIT 00 - ORIENTATION

DESCRIPTION

This unit provides the foundation for educators to engage in teaching future design literacies. It enables you to deconstruct your prior learning. It challenges you to re-evaluate your teaching practice with a view to reframe the intersection future - design - literacies.

The subject of this Unit is Teaching- This is about understanding how to create a learning environment where to teach future literacies by actively re-imagining the practices of teaching. What is crucial, therefore, is how to unlearn.
The content is centred on facilitating 'change makers' (i.e., your students) to develop the ability to navigate their way through uncertainty and complexity in their future-building practice. Through reflecting on

your positionality and its influence on your actions, you will be invited to identify spaces for inclusive interventions with the potential to transform peer / student experience.

The Unit is underpinned by the principles of collegiality and active participation. You will share your own knowledge and experience with the group, and give and receive feedback through presentations, discussion, micro-teaching and peer observation in an atmosphere of mutual support and solidarity. This is a space to foster self-criticality in relation to your teaching practice.
This Unit suggests a series of teaching tools and learning activities which are framed through a collaborative, participatory, reflective, hybrid and transdisciplinary ethos.

COMPETENCIES

The core competence of the Unit is to refine ways of working together to engage with uncertainty in a creative, critical and open manner. Specifically, by engaging with this unit you will acquire and demonstrate the following competencies:

• Reflecting on your attitudes to, and experiences of, learning and teaching to develop ethical awareness of your current position, practices, and contexts.
• Learning how to be empathic, to be an active listener and enabling others.

• Demystifying academic research, its purpose, and philosophical underpinnings, and how to decentering research canons, questioning histories and disciplinary silos

• Developing meaningful relationships with the community of educators, professionals, researchers with each other, and with other species (paying attention to the role of the nonhuman)

• Responding responsibly and ethically to complex situations arising within teaching and learning situations

• Understanding, embracing, and modelling the ethos of the unit. In other words, being prepared to embody the collegial, participatory and hybrid spirit of the unit, which intends to nurture self- reflection, openness, and practices of care tailored to whichever situation you find yourself in.

AIMS

The Unit will enable you:

• To support you to critically relate educational theory and practice (pedagogical knowledge) to your own disciplinary knowledge (e.g., design studies, future studies, engineering, art, and any other domain you are working with). The aim is to foster an ongoing reflection on how your field of expertise is taught and learned, and to view this process as dynamic and situated. For instance, by learning strategies on how to work with, and facilitate, learners' journey, group work and community building.

• To continually enhance your teaching practice in a way that responds to the complex and evolving contexts of institution, policy, and society. For instance, by examining the drive around decolonization, and other urgent matters emerging in society, by affirming education as a social purpose, which means reflecting on the future of design education, not on the future of educators only.

• To interrogate and demystify your current academic research language and practice so to be aware of gatekeeping mechanisms, and how they impinge on inclusivity and diversity. For instance, by looking at different modes of knowledge-production, hierarchies, and communication; challenging the status quo and developing awareness of alternatives (e.g., journals vs. zines).

DEPTH OF DETAIL

This Unit is a pre-requisite for educators before engaging with the rest of the material provided in Units 1-10. The purpose is twofold and concerns these two levels:

• **Level 1:** To provide a solid pedagogical platform ahead of engaging with the units 1-10. This unit will highlight and suggest practices in relation to ways of teaching with particular attention to groups dynamics, inclusivity, diversity, fairness and representation. It will also assist with making an informed choice among the units 1-10 through a selection of the pathways that best respond to your requirements, interests, and needs. It will introduce key terms (glossary) that you will encounter throughout.

• **Level 2 (meta-level):** To inspire educators to apply the learning gained through this unit to your own practice. The meta-level concerns how your way of teaching will change as you keep on engaging with the material and will impact on how your way of using the FUEL4Design material with your students. It fosters self-reflection and self-evaluation and is predicated on an ethos of education as transformative experience for educators and students alike. You, me, everyone: we are learning all the time.

3.
Developing Perspectives on Anticipatory Making & Methods

BY Andrew Morrison & Henry Mainsah

On methodological design futures ventures

In design, as elsewhere in the academy, inter-, multi- and trans-disciplinary pursuits have gathered force as counterweights to earlier knowledge typologies and binary separations between practice and analysis. This places additional demands on how we do and know what we know by what we do. This is compounded by our 21st century complex and contingent contexts and conditions of living and working, as we consistently address in this book concerning macro forces of climate change and a global pandemic and micro situations of pedagogical resilience and innovation but also to some degree resistance and revisionism.

Consider for a moment what the following two phrases might mean to you: *Learning design by anticipatory making* and *Making anticipatory design through learning*.

For us, these two propositions form the core threads in our making and making sense of the entwinings of designing, learning, knowing and understanding. These we see as relational and performative acts, events, encounters and engagements. We've taken these up in this subsection by referring to the work and thinking of a range of designer-educator-researchers and students (at masters' and doctoral levels) in the FUEL4DESIGN project. This work has been assembled to indicate some of the ways we might venture into shaping clearer bi-directional design methodological and pragmatics relations between making. knowing, learning and analysing.

These are to do with processes and activities that are centred philosophically and methodologically on becoming. This is about the ways and means through which our design futures literacies and pedagogies may be understood through how we go about working with design futures. It is also to do with ways our design futures literacies and pedagogies are influenced and realised through the methods, tools and techniques we take up and enact, implicitly and explicitly. What is especially important for design futures pedagogies in all of this is that such relational thinking, making and knowing is itself rather tangled in the ways design epistemologies are conveyed, pedagogically and methodologically. In this subsection, we focus on the methodological and offer some configurations and reflections.

Relational making involves us in learning and designing, reflecting and analysing where uncertainty, contingency, experience, experimentation and emergence prevail. In a design futures view, this means working imaginatively with these qualities

and processes in order to bring their indistinctness and uncomfortableness back into designing in the present. It allows one to work with the what-if as a material, methodologically, and to draw it closer to proximal, near present futures, just beyond the givens of the now (see **Essay 1: Anticipatory Design Literacies**).

A First Person Perspective (1PP) approach developed at ELISAVA as part of the DESIGN FUTURES SCOUTING work package **[→ SEE FEATURE 4]**. It is followed by reflection on a student project by the design teachers in which the focus is on exploring notions and materialisations of future work. This example, as with others across the essays related to the 1PP approach, indicates design futures learning through making alternatives to present realities to return to them critically and productively.

> *The main value of future scouting through making from my perspective it's this kind of situated and participatory practice, that allows you to get feedback continuously by co-creating together these future scenarios. So, the action of co-creating becomes a collaborative action, done in context with others. So, instead of presenting and getting feedback from expert people, what we're doing is presenting by creating an event in context with the community that you're working with. The feedback is done by the people that come to the event. If no one comes, that means that your project has no value. And if the people that come can also explain what they like, what they don't like about it. I think that this idea of bringing design to the ground, rather than keep it in an ivory tower, I think that that's the main approach - taking the situative and the participatory practices to the extreme and also keeping a coherence with all the different parts of the process. (Oscar Tomico, ELISAVA, from an interview with Vlad Lyachov).*

Our ventures into and indeed our prospects for realising meaningful personal and societal level design futures literacies needs closer attention to how we know what we have selected and planned in our curricula not in terms of detailed content or the micro-managing of what are often incredibly complex mosaics of teaching percentages and intricate tasks and overarching designs for successful and situated learning geared for changing worlds of work and research for our students.

As FUEL4DESIGN addresses, teaching and learning for by and with our master' and doctoral students, needs to continue to investigate and to perform design futures pedagogies that connect making and knowing, but, perhaps go further still, and unpack, reposition and reframe these methodologically. We suggest this because we see that our design pedagogies are themselves as much aligned with and even attuned to what are often implicit ways of working and knowing where the hugely important attention to designing and all that makes design in our pedagogies what it is may be underarticulated methodologically.

This has been what our Intellectual Output IO5: FUTURES LITERACY METHODS sought to make accessible through providing position pieces and related resources for design educators. However, the content and concerns raised there also apply in the learning journeys of our students as they grapple with the ways and means to realising concepts and processes and their embodiment in design works and analyses.

Reflecting on Methodologies and Futures Scouting

BY Oscar Tomico, Guim Espelt Estopà, Jana Tothill, Roger Guilemany & Mariana Quintero
COURSE: MDEF 2020-2021, ELISAVA & IAAC. Master's in Design for Emergent Futures.
PROJECT: Imagine. Future of jobs

STUDENT: Wongsathon Choonhavan

Wongsathon Choonhavan undertook his master's degree with a clear idea in mind. In his past, he had been supporting young students to recognise their future professional identity, their future jobs. He was concerned about the rapid changing nature of professions and how it makes defining future professional practices very unstable, and wondered how career counselling support should become for future generations. Choonhavan sought to design learning experiences that would help presenting alternatives to current approaches to this topic.

Although Choonhavan had already a clear idea in mind, in the initial exercise of the 'Atlas of Weak Signals'. He framed his area of research using 'New Jobs', 'Human-Machine Creative Collaborations', 'Carbon neutral Lifestyles', 'Climate Conscious', 'Pick Your Own Passport', 'Rural Futures', 'Disrupt Ageism', and 'Redesigning the Social'. He mapped this wide variety of interests, related them, and found possible projects to undertake (Figure 1). From this exploration, he decided to go

with his more personal concern on future careers for young generations. He deployed four design interventions that constituted the entire research of the project (Figure 2). Each intervention was related to a new context of application that he would explore and incorporate by means of comparison. The first context of application was education, for which he designed a series of workshops called 'Imagine the future of jobs with Magic Machines', speculating about future professional identities. This intervention and context of exploration was meant to open the project's main concept to children motivated by futures speculation.

His second intervention opened a context of play. He designed a 'Collage Toy' that allowed children to explore new jobs by radically imaging futures using collage. He designed a set of cards that present possible futures. By using the technique of collage, children could begin to imagine possible futures and start conforming future professional identities (Figure 3).

▲ Figure 1: ' Wongsathon Choonhavan 'Atlas of Weak Signals' mapping possible design interventions (above).

▲ Figure 2: Wongsathon Choonhavan design interventions and contexts (centre).

◄ Figure 3: Caption from Wongsathon Choonhavan's 'Imagine the future of jobs with Magic Machine' workshop.

2065 Space traveling

In this world, people can move to live on other planets or travel in space. We will see new things that we have never seen before.

What is a job that you want to do?

Astronaut Gardener

He then explored another approach focusing on motivating children's curiosity. He designed and prototyped a 'Gachapon' machine that gives away small figures of future professions with a text explaining it and a QR code linked to a dedicated Instagram account, informed from previous workshops and observations from the game (Figure 4).

The fourth context of application was also meant to arouse curiosity and to give access to imagining future jobs to a wider public. He curated an 'Instagram Account' with the results from his workshops and the toy machine (Figure 5). His aim was to inspire others and promote the project to create awareness on future generations about future jobs and its instability in our ever-evolving current context. It also served the purpose of communicating the project to arise new opportunities to intervene.

Choonhavan engaged futures by comparison (Figure 6). In the early stages of the master's program, he already defined a clear concept to work with. He approached it by deploying and testing his core idea of future jobs in four different contexts, and his research was characterised by learnings

from each one. This comparative approach allowed him to scout new knowledge and incorporated it in his main project (Figure 7).

NOTES

1. See Wongsathon Choonhavan's master's repository. **Link** ↗.

2. Developed in collaboration with classmate Dafni Gerodimou.

3. See Kristina Andersen (2012) for reference on 'Magic Machines'.

4. These machines, very common in Japan, every time a person spins a wheel, give away a ball with a small surprise inside.

5. See **Link** ↗.

◄ Figure 4: 'Wongsathon Choonhavan's 'Collage Toy' (top).

◄ Figure 5: Wongsathon Choonhavan's 'Gachapon: Job for the future' (middle).

▲ Figure 6: Posts from Wongsathon Choonhavan's Instagram account @jobsfromfuture (top).

▲ Figure 7: Wongsathon Choonhavan's Ways of Drifting in Futures Scouting representation (bottom).

Practice and preparation for professions are changing. It's not a linear shift, but rather a priming. This is about more than an apprenticeship model of developing skills and competencies-based learning. It is a shift towards capacities and fluencies on and in and as design articulations that are about situating learning as becoming. This is a matter of learning how to learn and how to apply tangible skills to diverse, emergent and unexpected contexts.

For PhD students design has increasingly become both a multiple knowledge domain, in terms of meaning and of making, while it is also working to articulate tis own identity and particularly design-located modes of knowing. The training of designer researchers asks that we develop and support curricula, and especially sensitivity and acuity in working with design and research methodological perspectives and their select methods, tools and techniques. Here though there is a further matter of those methods, tools and techniques are often used indiscriminately in elaborations of design based making and design research activities (see e.g. Morrison et al., 2019). This we take up later in this section; it is also activated in Essay 8: Tools, Means and Mediating Design Futures.

Such focus has been taken up on design research in the past three decades or so. However, the methodological world views of design-research - as pluralist, situated and co-creative, to mention a few of its emergent features - are themselves, just as with other disciplines, characterised by configurations and preferences of methods, techniques and tools. In our work in design futures learning we need to heed how received and prevailing methods and means direct our inquiries. But we also need to address how ones we are in the processes of shaping also do so but are in need of critical re-assessment for the values and orientations they embody and thus embed. Mazé (2019), for example, referring to the work of Glenn, cautions us to think about ways positioning our approaches to futures in design influence and impact on not only the 'how' of what we know and how well we know it but also the difference it makes. Her own work in design and futures that addresses this is located within feminist practices (see e.g. Lather, 1988, Schalk et al., 2017). Mazé consistently embodies ways programmes, projects, pedagogies and practices may be understood through modes of methodological gendered positionality in trying to grasp the ever-slippery elusiveness of futures in design inquiry (see Mazé & Redström, 2007; Mazé, 2014, Mazé & Wangel, 2017).

Below we address similar concerns in focusing on three linked themes: 1) unpacking design and knowing, 2) reviewing approaches to Research through Design (RtD), and 3) developments in what may be grouped under what we call 'design anticipatory methodologies and methods'.

Unpacking design and knowing

Along with socio-technical development and advances, in shifts from subsistence to post-industrial societies Design has increasingly moved from individual, expert handcraft to digital, algorithmic technical recombination and permutation. This is not

to motivate for a staged evolutionary or modernist notion of techno-driven innovation and progression. However, Design's changing practices and professionalism is deeply entangled with socio-technical novelty and the dynamics of human ingenuity and creativity in shaping our present through knowledge of the past and reaching towards alternate, different or even radically transformative futures. Marenko (2018, 2021), for example talks of a digital 'FutureCrafting'. She conceptualises this as speculative methodology (Marenko, 2018) in the context of imagining alternate narratives around the performative autonomies of Artificial Intelligence for less techno-determinist coevolution of the human and technological. Such a 'FutureCrafting' is position as a forensic, diagnostic and divinatory method. Its genesis and character are evident in the FUTURE PHILOSOPHICAL PILLS developed by Betti Marenko and her team at UAL that sees less antagonistic and more coevolutionary approach (Marenko, 2021) to learning future knowing through designing and drawing futures what if figurations into design learning through making.

Such a view highlights that intersections between research methodologies and methods and design techniques and tools have become more explicitly patterned, mapped and applied as design has moved from mid-20th century structural-functionalism to already manifesting mid 21st century anticipatory design dynamics. The workings of design as a mode of making - from the conceptualisation to marketing and uses of smart products to situated service experiences - are cross-linked with ways of knowing. Design inquiry has too often found this entanglement and relational dynamic of making-knowing difficult to analyse when the framings of how design works and may be analysed separate what is complex, rich and changing. Part of this difficulty lies in emerging understandings of processes and materialiations of expertise and their articulations in products, systems, interactions, experiences, uses, services and policies. Such understanding is hard to clarify both within and beyond design.

Over the past five decades design inquiry has become more formalised in the ongoing shaping of design pedagogies and practices and their links with design research. This is in part embodied in the growth of design research and its ongoing location in participatory, user-centred and contextual practices within major changes in design schools from practice-oriented, 'polytechnical' institutions, to universities with a mesh of domains, expertise and practices in which design research is often realised in partnerships with others and has shifted from problem solving to finding. Mirroring major societal and intellectual developments into changing relations between practice and theory, we have seen a series of methodological shifts and along with them the application of design and research methods that inculcate their world views. This reaches from and praxiological framings of design and expertise (e.g. Lawson & Dorst, 2009), design and innovation (Dorst, 2015) and counter-framing relations between design and democracy. In the latter, Prendeville and Syperek (2021) discuss democratic aspects of a 'new normal' in the context of relations between sustainability, participatory design and the pandemic.

Many of the shifts in modes of design knowing - from craft to a multiple domain of intersecting and overlapping design 'disciplines' as part of a shift from industrial to post-industrial economies – have often shied away from deeper methodological

analyses in favour of pragmatist epistemologies. Consequently, design inquiry has tended to avoid deconstructing the deeper workings of designing at a methodological level and, in together, it may be argued that the dynamics of methods actively taken up are assumed or ascribed given status and effect. Further below we take up some recent developments in reframing design knowing, as making-analysis, in regard to feminist and queer, decolonial and post-qualitive modes of inquiry (e.g. St Pierre, 2016).

It's useful to remind us of some of the main features of design inquiry to try to sift out various perspectives and preferred or incipient methodological views that prevail and are entangled within our approaches to design teaching and research. Readers interested in specifically futures design pedagogies and inquiry may ask if we need to do this. We suggest that it's a core need if we are to escape mismatches and misconstruals in shaping anticipatory design methodologies, methods, literacies and pedagogies. These are influenced by trends, norms and practices form design inquiry and from learning theories, and from making practices in design and design teaching. Writing about futures and epistemologies (Sardar, 2022b: 3) explains that:

> *The evolving horizon of knowledge not only affects how we see the present, and perceive futures, but also raises fundamental questions of meaning and being. It strikes a double whammy on the epistemological front: it makes it difficult to map the rapidly changing nature of emerging knowledge; and, given a host of ignorances and uncertainties, understanding and navigating epistemological change becomes a formidable task.*

For design educators and researchers of design education, negotiating epistemological change demands we look to our own practices and frameworks as well as those of disciplines with which we partner and intersect.

As our IOs 4 and 5 in FUEL4DESIGN probed and projected, we also need to look critically at how Futures Studies has carried forward many methods and assumptions from planning and strategic decision-making and how related tools bear world views on futuring, and for us design futuring. However, we also need to unpack some of the key practices and positions design inquiry activates and implements. We move next to reconsider the prevalence of Research through Design (RtD) and to how it also impacts on ways we carry out our pedagogies and structures and orients how we know what we know, including anticipatorially.

Reviewing approaches to Research through Design

Endeavours to better clarify and position relations of making and knowing, in the past three decades or so design educators and design researchers have drawn on demarcations of ways design knowing have been led and located in practice, action and reflection (e.g. Crouch & Pearce, 2012; Nelson & Stolterman, 2014). For master's and PhD students designing and reflecting on design and learning has increasingly been influenced by pragmatist modes knowing in action, flavoured by the much cited work of Schön (1983, 1987). Attention to practice in design learning and inquiry has been about asserting ways tacit knowledge embodied in making and use might be more

LEARNING DESIGN BY MAKING FUTURES

fully understood in designerly ways in terms of practice-based education and applied research. Such perspectives have motivated for a mode of understanding that is driven by the hands of designers and via methods of carrying out design research in which design is a kind of third wheel a praxiological, situated and enacted knowledge generating dynamo of sorts in its own right. Such developments have been widely covered in design publications (e.g. Rodgers & Yee, 2015). We will not re-rehearse them in detail here, rather accentuate some of their historiographic highlights before moving on to deconstructing key methodological directions and positionings that have resulted [→ SEE **FEATURE 5**].

One of the enframing strategies methodologically that has influenced how design has gone about understanding elation between making-knowing arose by way of design aspiring to be a science with the inlaying of related methodological practices (e.g. Simon, 1969; Archer 1973). Here focus was on a pursuit of legitimacy for design as a way of knowing through practice and design as a 'discipline (Cross, 2007). With the expansion of disciplines in design and design universities as including a diversity of domain areas, focus shifted to one designerly modes of knowing (Cross, 2001, 2006). This accentuated a mix of deductive, inductive and abductive activity and expertise (e.g. Lawson & Dorst, 2009) in a pragmatics of practice-based inquiry, often with prevailing empiricist methods. These developments also took place in the context of design education, still much centred in master's practice, expanding to include practice-based doctoral studies that highlighted explorations in shaping knowing and understanding via various weightings of practice and analysis, such as at RMIT in Australia (Vaughan & Morrison, 2014).

Frequently, such expansions have been characterised by demarcations made about RtD by Frayling (1993) as: on, in, as or through design. In such orientations a distinction has also been made as to research with a small 'r' and capital 'R', the former linked with processes of gathering and sifting for design production and the latter for academic-style analysis. Increasingly, following Glanville (2005), 'design for' has come forward in some design research settings, such as the RCA in the U.K., as argued by Gandon and Hall (2022), while in Nordic settings in contrast the interplays between design making and researching in design education are frequently central to knowledge shaped through designing and researching (Mainsah et al., 2017). The use of the gerund form '-ing' here accentuates this, following similar arguments to attend to the processes and dynamics of how we come to know and bring knowing into being (Lury et al., 2018).

All in all, research through design has been elaborated on in the contexts of venues and situatedness in the 'lab, field and showroom' (Koskinen et al., 2011), also understood in terms of design education as regards the studio, brief, stakeholders and 'street' (Snaddon et al., 2017; Morrison et al., 2019; Snaddon et al., 2019) with focus on place, users and participation and modes of mediation. Key aspects addressed in elaborating RtD have included interaction design (Zimmerman et al., 2010; Gaver, 2012), makers and materialities such as regarding D.I.Y. and hacking (Durrant, et al., 2017), and a shift of focus on participation and users to non-human agents and 'connected things' (e.g. Giaccardi, 2019).

Working beyond divisions in making-knowing-learning

BY Henry Mainsah and Andrew Morrison

GUEST: Prof Henry Mainsah

AFFILIATION: Social science, media and design methods researcher; Consumption Research, OsloMet University, Norway.

A discussion

Andrew: Hi Henry. Good to see you again and to continue our discussions on methods matters. Is there anything in recent months that's come up in your work that we might start our conversation by mentioning?

Henry: Yes, as a result of social distancing and increasing recourse to digital platforms and tools for work and research has forced us to consider how it makes it possible or hinders how we conduct and understand research our methods. This involves design, of course, as it is about different research events I've attended where this has been a topic.

Andrew: Could you elaborate a bit on that in terms of prevailing and emerging discourses?

Henry: In a current project I'm in the pandemic situation has forced us to reconfigure our approaches to engage young participants in different contexts in four European contexts. The first is we are facing is how you enact co-design activities in remote settings. Because the researchers in the project are not fully practised in the context and affordances, they have faced challenges, and a first impulse has been to transfer their usual physical over to digital - and proves not to be successful for these emerging changing, futures challenges. Also, dichotomies appear. The kind of language I hear from designers about methods is often connected to linear views and making artificial divisions between design and research and when and how they happen.

There's a tendency to conflate methods, tools and techniques. Design researchers tend to want to introduce a lot of silences in how their methods are enacted and how their insights and knowledge are surfaced. A discourse of dichotomies obscures a lot of performance of important elements and events in the process of knowledge making and gives a skewed image of design research in practice.

Andrew: You mentioned silences. Could you please say a bit more about those.

Henry: Yes, for example, I remember a period when I was AHO and researcher came to talk about his methods PhD chapter, a practised designer, and to frame workshops he had conducted with an organisation. What he presented as a method was a set of steps and tools. But, he failed to acknowledge the role and importance of his presence and his role as a facilitator in shaping what happened. These are often left out of methodological accounts. The role of the body. Interactions in a workshop session. Identities. Messiness too is usually in the final account of methodologies in research texts (articles, theses) there is a tendency to present ways applied as smooth. Unfinished drafts, mistakes, failures and inconsistencies as to how methods are enacted tend to be left out. I see this as partly a fear of meeting conventions of academic research, and erroneous assumptions that this will not qualify as rigorous research.

Andrew: So, are you saying Henry that there's a place for this to be taken up in the curriculum?

Henry: Definitely. There is a need to capture the uniqueness of design inquiry and develop analytical approaches and methodological frameworks that doesn't just copy other disciplines. It's needed us to look into how methods are taught. This is a matter of methods literacies, methods pedagogies.

Andrew: You've said earlier in our talks, including the LEXICON, that it's also important to find the language and ways of conveying the uniqueness of methods and their role on knowledge making in design inquiry. Could you elaborate on this please?

Henry: Well, firstly the issue of devising the methodological frameworks and epistemologies and also a need to explore further the different mixed modes of conveying meaning – still images, written, the sensory, and the tangible - that embody the types of knowledge that can be generated through design inquiry. Paradoxically, all these things that designers know how to do can be transferred into how they give accounts of their knowledge making.
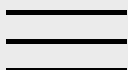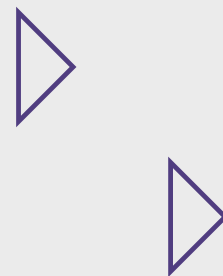
Much of this work has been linked to product and computationally centred design in an empiricist frame, also encapsulated in a state-of-the-art piece by Stappers and Giaccardi (2017). Often overlooked sociocultural framings of design and related methodological orientations are infused with theories and practices from the human sciences where focus is less on tools and functionalities and more-so on ¨performativity and situated meaning. As we have argued, attention is needed to working experimentally in our pedagogies and in their stewardship, monitoring and assessment (Mainsah & Morrison, 2013) that is further oriented towards the prospective, critical and probabilistic (not rigour for replicability). Design may be understood in terms of its know-hows as shaping futures due to and within its creative practices and situated analyses, not compliance with academic disciplinarity founded on different compositional logics and practices of knowing.

A key venue for this for supporting doctoral students in learning to be design researchers has been realised through the RTD conference series that engage young researchers in working through and articulating designerly modes of communicating design research practices and researching through designing. The 2015 RTD Conference resulted in a special issue of the journal *Design Issues* and the 2019 conference, the most recent due to the pandemic, provides a diversity of projects and permutations of RtD inquiries and related learning in a focus on 'Method & Critique' (see *Proceedings* **Link ↗**).

Recently, Redström (2022) outlined a reconsidered view on research through design in 'research through and through design' in which he addresses what it is we foreground in our preoccupations and practices of this approach to working through that pervades deign inquiry (and impacts on teaching and futures). Redström discusses three perspectives on RtD – through practice, through making and through judgement – and how these bring to the foreground different possibilities and implications for future directions. As the first two have been addressed above, we turn to his third perspective that the presents in terms of aesthetics, and from a Kantian view.

For Redström, it is attention to aesthetics in design inquiry as realised through making that is largely absent in RtD and that it this gap that adds to the fuller potential for design inquiry to escape the pursuit of epistemological legitimacy as mention in the material above and to arrive at its own taste-based expression and value. Taste is always also about matters of working from the particular to the general, less the familiar and more the emergent, and always related to what a subject is shaping and choosing. Redström sees this as to do with cultural framings of such taste and their extension in contemporary societies to matters of how these are materialised in diverse positions, where difference is central where located in feminist, decolonial or post-humanist orientations or trajectories. He argues we need to consider how judgements differ to how they work and also how we make them and that it means to do so in a good way (Redström, 2022: 16.16).

As we turn to next, in our work we have approached what we've explained to students as 'cultures of RtD' and that these are about situated experience and knowledge sharing in

acts of designing, learning and researching. They are about things and knowing coming into being. Redström (2022: 16.15) puts it this way:

> *From the perspective of judgement, research through design is not necessarily a process or method, or even a certain skillset, but an ability to, through making, approach the world aesthetically – that is, on the basis of the particular, from the bottom up as if we do not yet know it. When kept open and not instrumentalized, it approaches the world through wondering, not ordering, taking seriously that which becomes before us is indeed unique and not just another instance of something already familiar.*

Concerning extending more established perspectives of knowing through making to include aesthetics, we suggest we might also reconfigure such matters of taste to include perspectives of researching design and knowing through two additional modes of making-knowing: through learning and through anticipating.

Toward design learning and anticipatory methodologies

Different domains of design nevertheless perpetuate modes of inquiry, and are implicated in promotional discourse linked with business and types of innovation, such as in 'design thinking' and Service Design. Doctoral and master's students are asked to design anew, with orientation to social and material issues, technically and communicatively. Yet in order to disentangle themselves from our already limited room for future manoeuvres in the bounded limits of time and rises in temperature to avert further climate change ahead of us, not immediately. Together we already need to think more critically and creatively about their own modes of learning and making in which methods matter, and that methods of designing and researching through anticipation come into being and are explored and strengthened [→ SEE FEATURE 6]. In a critical reconsideration of the work of Frayling, Galdon and Hall (2022: 931) conclude that:

> *We see an evolution towards a hybridized research practice where the practice itself becomes research for designing practice conducted through designing research. It becomes a 'research-for' approach where the practices observed are not those of a design studio or a classic designer, and neither are they conventional academic approaches. The core practice becomes a designing research approach which is neither industrially-led nor convention-ally academic but seeks to leverage the designerly permissions to embrace new forms of design research knowing.*

In front of us are spaces and opportunities, a methodological what-if, that offers us the possibility to reach for a reframing of knowing through anticipatory designing while drawing further forth a mode of research through anticipatory design.

This framing is a relational one: today, in contrast to earlier less probabilistic and more predictive notions, design-research operates in a mode of knowing between practice and analysis where co-creation and co-design contribute to knowledge exchange, less binary separation.

Critical reflections on futures methods

BY Manuela Celi & Ammer Harb

Aim

The aim of Unit 09 is to activate criticality by mastering and enacting critical activities to be applied to the work done in the other Units.

Unit 09 suggests practical applications using a range of defamiliarisation techniques that encourage you to create the space needed to enhance sense-making skills by 'doing criticality in action'. De-familiarisation works by moving your awareness out of what you know and plunging your attention into a different realm.

Some techniques to enhance criticality are to:

Re-visit • Re-imagine • Reverse • Twist • Swap: working in small groups students to swap their work with each other • Decode + Recode • Make it happen (act as an activist).

PhD Futures Thinkathon 2020 (PoliMI & partners)

The aim of this intensive workshop was to introduce contributing partner institutions' PhD Design students to current development and research in futures literacies; to connect them to research methods and content of futures literacies; and to train them in applying futures literacy methods and content in the PhD research practice.

Due to the COVID-19 emergency, the workshop was conducted in a digital mode using platforms suitable for teams working remotely: 'Microsoft Teams and Miro: An Online Visual Collaboration Platform for Teamwork'. The workshop was managed by Politecnico di Milano FUEL4DESIGN research team. The platforms, canvases and tools used during the presentation had been prepared beforehand in order to ensure a smooth process and time saving in the three days' intensive workshop. It's worth noting that the digital mode of the workshop

provided many opportunities and opened up new spaces of creativity that enhanced the cooperation and collaboration between the participants during the days together.

Canvases were designed to allow participants to brainstorm freely and included a blank design space for each team to gather ideas, visual material and rough concepts, before adding them to the canvas as a final output. Each phase had its own canvases that were used to systematically allow participants to organise their thoughts and to capitalise on the diagramming capabilities of the canvases. These diagramming capabilities were on offer to foster creativity in brainstorming and to open up a space for discussion. The canvases were made in the form of templates that participants filled out with brainstorming items and discussion results.

Example

In this group, participants used the Philosophical Pills cards to challenge the project statement they came up with. They used the post-anthropocene card to see how this concept might or might not affect the topical issue they have identified in previous stages.

The Future Philosophical Pills helped participants in delving deeper in the future issue they were trying to debate about. It helped them see different perspectives and future challenges they might have not identified in the preceding exercises. The Pills helped participants to raise unusual critical questions: they challenged their understanding and mindset and helped them to cross borders of what they already knew.

The tools developed during F4D were produced to support educators and students in elevating their futures literacy and to support them in triggering critical discussions in futures design. From the testing sessions, users of FUEL4DESIGN tools were engaged to try out the different tools and methods presented.

The tools are meant to work as a catalyst in this process of discourse around future issues. They played the role of triggering actions, activating debates, and disturbing discussions about the focal issues. Tools - for instance the Future Philosophical Pills - added new dimensions to the debate which, in turn, widened the users' understanding of topical issues in design futures such as Animism and Post-Anthropocene.
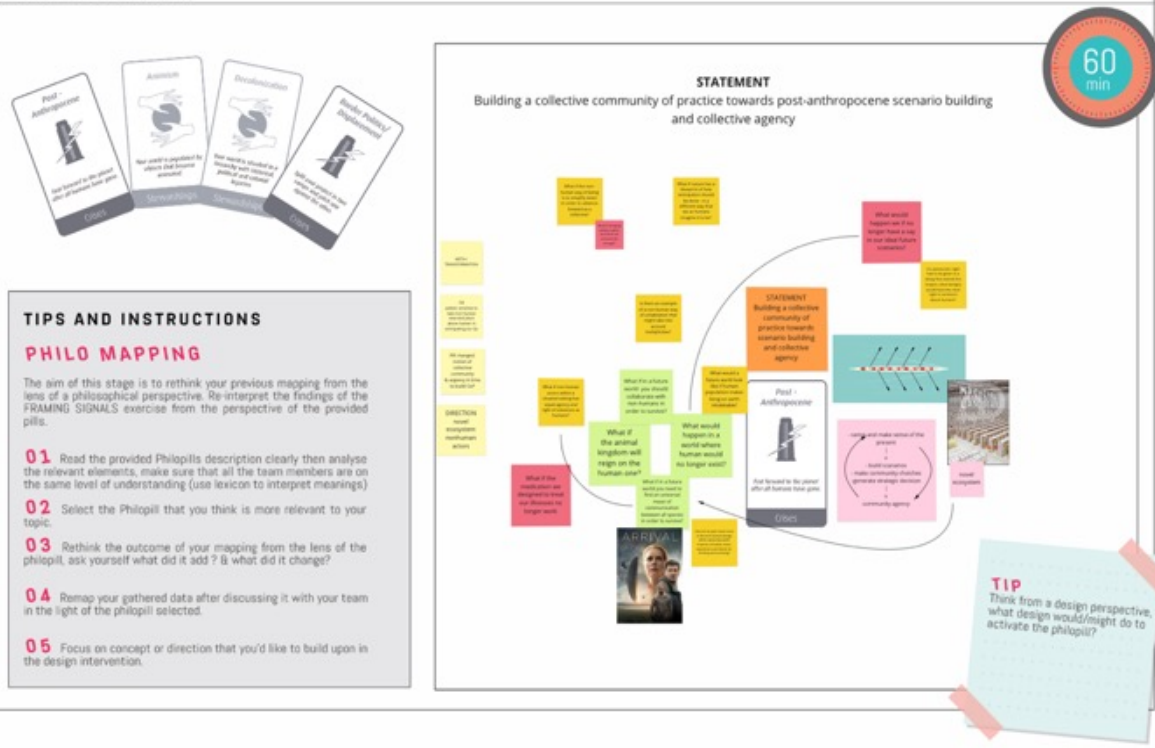
The fact that these tools were designed to disrupt the process with either early action or an action that encourages critical view of the future has nurtured how users look at their focal issue from plural and deep perspectives.

Some tools need higher intellectual interpretation than others, for example the VERGE analysis versus the PESTLE analysis. During the testing phase, some users had difficulties in responding to the tough concepts session which might indicate that we need to highlight the differences in the required time for conducting particular tools. In general, users' response to tools with direct or understandable call of action was higher than with tools that need extra understanding and knowledge beforehand (for example: design interventions and design fiction). Participants tended to use the tools they better relate to and understand.

Design educators and researchers have called for undisciplining design schools and by way of 'alterplinarity' (not disciplinarity; Rodgers & Bremner 2019) as well as for design to reposition its own 'locative' knowing (Edeholt, 2022) by shifting again to what makes it a unique pursuit and domain of knowing and learning. Design education and research are in different degrees of dialogue with 'the academy', including calls to 'rebellious research' (Bernard et al., 2022), as it too engages in reconfiguring its workings via engagement in critical pragmatism, new materialism and post-perspectives on qualitative inquiry, including agency, non-binary thinking and ecological reframings.

Common to such reframings is concern with situations, affect and affordances. These are realised in socio-material practices, including ones that are anticipatory, and may be understood in research and pedagogical terms as matters of reframing. For Kuntz (2016: 128-129).

> *… we can no longer rely solely on external frames with which to square our understandings; instead, we need to develop relational means of inquiry, materially ensconced practices of truth-telling that open up possible futures. Further, the act of truth-telling necessarily disrupts normative function—to tell the truth is to foreclose normative interpretation in favor of previously unimaginable engagements within the world. This is the promise of possibility that is forever emergent within critical inquiry.*

Prendeville & Syperek (2021: 112) argue that we apply counter-framing to create new spaces and perspectives:

> *Through their very conflicts, these counter-frames offer spaces in which 'new paradigms' may be carved out of obsolete discourses and divisions, via new methods including some of the strategies we outline, such as storytelling practices and other design tactics. Doing so, counter-frames in their essence both fill in and open up spaces for political debate. Taking this point seriously would also allow for overcoming an instrumental view on the potential of the concept of counter-frames.*

More recently, design inquiry - as a more plural, relational and emergent pursuit, practice and mediation - has taken up specifically design abductive modes of making and knowing situated in rapidly changing socio-technological and especially ecological frames (ref) in which, in addition, attention is being focused performatively on the contingent, uncertain, emergent, transitional and transitory.

Recently, Mortai (2022) schematised such shifts in which:

> *… problem seeking or visual problem seeking could become one of the new knowledge areas to be cultivated, needing new design methods and practices. Further, despite claiming to be more attentive to users' needs and lived experiences, design is still developing products, services, and systems that only reductively integrate race, class, gender, sexuality, and ability. (Mortai, 2022: 34).*

However, design has only more recently begun to more fully heed feminist (e.g. Schalk et al., 2017), decolonial (e.g. Tuhiwa Smith, 2021), posthuman (Veselova et al., 2022) and post-qualitative methodological perspectives (e.g. Lather & St. Pierre 2013; Thomas & Bellingham, 2020; St. Pierre, 2021) in its pedagogies, practices and research – and significantly in their relations not separations. In these developments, epistemological framings and enactment of design have been lively and have reached to work with the new and the possible.

Perhaps more often than not, the underlying framings of design have not been deconstructed as to the values, world views, attendant and inscribed methodologies and related methods that have been adopted and adapted in designing, design pedagogies and design-centred researching. These are practices-in-the-making, and are occurring in the context of post-truth (Rommetvieit, 2020), and the circulation of multiple truths, conspiracies and 'fake news', all amplified via informational-attraction driven values of social media design, that needs to be linked to ways of realising design futures literacies as situated in which a key tasks is:

> … *how to identify, analyse, and critique the production of ignorance and non-knowing, as parasitic on, possibly breaking free from, major existing regimes of truth. The relations described are, more often than not, highly asymmetrical, and can be described and critiqued as such, as arising within political economies of knowing and non-knowing, and referenced in some situation.' (Rommetveit, 2020. 19).*

Such political economies of no/knowing are being realised in 'postnormal times' (Sardar, 2022a) and epistemologies that are culturally and ideologically situated beyond assumed and circulated western mantles and of meaning making (Sardar, 2022b). Clearly, our pedagogical and research methods rhetoric are themselves part of a shifting materiality of design making-knowing. This extends to how we articulate post-qualitative methodologies in our reflective practices. St. Pierre (2018. 4) comments on the writing of post-qualitative inquiry as follows:

> *Inquiry should begin with the too strange and the too much. The rest is what everyone knows, what everyone does, the ordinary, repetition. Post qualitative inquiry asks that we push toward the intensive, barely intelligible variation in living that shocks us and asks us to be worthy of it. It asks us to trust that something unimaginable might come out that might change the world bit by bit, word by word, sentence by sentence. Writing is, after all, a method of inquiry. In writing, we can and do invent and reinvent the world.*

These reflections apply equally in our view to the multimodality of mixed and messy approaches to methods (Law, 2004), in what Koro (2016) refers to as fluid, non-linear and multiple spaces. 'methodological flows and approaches do not collapse or disappoint. Instead, they melt, transform, circumvent, infiltrate, appear, and disappear while opening up new directions for qualitative research'. (Koro, 2016: xx-xi) goes so far as to argue for reconceptualising the norms of qualitative research by paying attention to

irruptions, the unthinkable, poetic textual shifts, changes in discursive and linguistic pace, and rethinking more critical uses of data:

> *I propose that 'before,' 'present,' and 'after' do not signify fixed notions of time, but form temporary conceptual linkages between events that are overturned or questioned by the next emerging or established linkage/event. … I also refer to productive failures as unfinished and unceasingly emergent research and writing that pose ongoing challenges to scholars due to their emergent and surprising character. When one approaches methodologies without methodology, from the perspective of productive failures, one commits to reinventing, revising, and reenvisioning methodologies today and in the future. The methodological work needs to stay in motion and under constant inquiry and questioning. (Koro, 2016).*

FUEL4DESIGN has engaged actively and experimentally with change in process, with flux and uncertainty, with complex systems, contexts and conditions, amongst others (Figure 3). We have approached Futures Studies as itself a changing and pluralising field, such as indicated in the work of Gidley et al. (2009) on participatory futures methods and recent elaboration of a related radical plural epistemology (Gidley, 2021) encompassing critical-postmodern, cultural-interpretative, participatory-prospective, integral-holistic elements.In doing so, and with our students interests at the fore, we have needed to engage in modes of shaping and making and teaching and learning that work with the unknown and the emergent. Koro (2016: xxi) argues that 'methodology calls for responsible decision-making in the face of the unknown.' She writes that:

> *I also encourage scholars to shy away from easy methodological practices, decontextualized methodological decision-making, and the uncomplicated use of methodology. Instead, I direct attention to responsibility, cultural values, troublesome questions, multiple viewpoints, and ideological and methodological impossibilities. (Koro, 2016: xxi).*

For us, an anticipatory relational epistemology is exploratory and it is emergent. It works with unknowns and uncertainties. An anticipatory relational epistemology reaches for prospective not retrospective knowledge via imaginative, creative, critical and enacted design that is infused with making activities that reach for the seemingly impossible and even utopian, and return these to action and reflections of human-non-human agency, systems and interactions in the here-and-now, and for ways ahead. Further, these design futures literacies are being and are to be articulated through the means, methods and methodolgies we use to debunk-false claims and news skewed by way of platform technologies based in ideologised profit centred values.

Further still, these are design futures pedagogies and literacies activated for not just 'telling truths' via critique (Knutz, 2016: 97) but need to embody methodological risk-taking and methodological responsibility (Knutz, 2016: 109) in shaping new ones that are plausible and inspirational. Thereby they may motivate our engagement to work together towards longer term, happier and more equitabe and survivable planetary futures (akin to 'Curriculum for new material, new empirical inquiry' by St Pierre, 2016).

4.
Making Futures Design Literacies Material
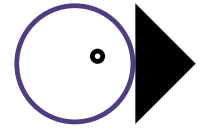
Working with compositional methodologies

BY Andrew Morrison, Corbin Raymond & Henry Mainsah

Problem spaces, composition and methodology

Learning how to work with design and futures-oriented inquiry at a methodological level places demands on students' and teachers' attention. This appears to be about conceptualisations as to how we know what we know through how we frame the ways we position our approaches to design and research methods, techniques and tools. For many designers, students and professionals alike, talk by design teacher and designer-researchers of the methodological is confusing.

Why add in a layer of how to get on with designing when one can focus on methods and tools? What focus on a meta level of how we know what we know when we need to enact designs and perform research by design?

In design education and design research, these matters a great deal. Pedagogically, we need to be able to position the knowledge framings of how we realise and study our endeavours. In terms of design research, we need to frame the selection and interplay of methods and tools through which our investigations and ventures are structured and understood. This may be seen as a matter of 'design composition'. In Inventive Methods Lury and Wakeford (2012: Kindle) write that:

> When the term composition is used in the visual and performing arts the emphasis is on the creativity of this action of putting things together. It is used here... to describe a methodology in which the focus is on the ways in which a problem is put together, how it is formed and transformed, inventively.

Recently, Lury (2021) takes up the notion of problem spaces with methodology in framing what she calls 'compositional methodology'. She discusses this to frame new ways of knowing that may be arrived at by staying with problems and their changing character as we work with them relationally again and again, in and over time [→ SEE FEATURE 7].

Toward methodological composition by design

As part of our ongoing collaboration over the past decade on design education and design research, our work focuses on relations between anticipatory designing, making. Learning and methodologies. Located in the context of a doctoral research project and participation in FUEL4DESIGN by Corbin Raymond at AHO, as a co-researcher we have reflected on design work developed to explore a heuristic process of 'methodological composition by design'.

Raymond has developed 'methodological composition by design' in a mix of media to we present a design based compositional methodology in a mix of media and methods to reframe and rethink approaches to early phase scenario thinking (Sarpong, 2011; Sarpong & Maclean, 2011). The design and analysis are linked with work on scenario building and scenario canvases (Wright et al., 2013) and a mode of methodological diagramming (Dudley-Smith & Whiteman, 2020) extended to design and speculative diagramming (e.g. Marenko & Benqué, 2019). Shown in Feature 8 are design methodological moves and reflections as to how scenarios and diagramming may be realised in the contexts of plural, imagined futures methodologies through a mode of what we term 'anticipatory futuring by designing'.
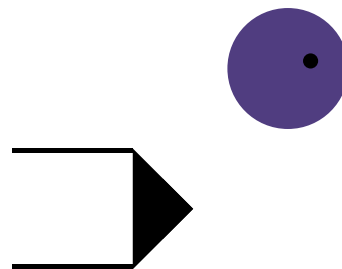
From 3d form to digital diagramming, to situated scenarios development

BY Corbin Raymond, Andrew Morrison & Henry Mainsah

EXCERPT FROM: Raymond, C., Morrison, A. & Mainsah, H. (2022). 'Framing scenario thinking in a mode of futures by design inquiry'. In *Proceedings of DRS Bilboa 2022*. 25 June-3 July, Bilbao, Spain. Link ↗.

PHD BY COMPILATION PROJECT: Corbin Raymond

TITLE: *Go with the Flow*

SUPERVISORS: Prof. Andrew Morrison (AHO, Norway) & Prof. Elmarie Costandius (University of Stellenbosh, South Africa)

Focus

How can a design based, situated, cultural and non-representational approach to shaping futures through scenario thinking be developed? To address this question, our paper proposes an approach to shaping futures through scenario-thinking that we term "Compositional Methodology by Design Research". It does so through the crafting of socio-material compositional affordances and articulations by design. This approach is offered as a design methodological move to support the development of alternative situated, cultural and non-representational approaches to scenarios. We illustrate our proposed compositional methodology through a series of paper-based scenario thinking artifacts designed to allow designers and citizen-designers, policy-makers, NGOs and community-based environmental activists to engage in conceptualising their situated futures.

Design compositional methodologies

When approaching the framings of scenarios in terms of thinking and thinking with and through what we see as socio-material compositional affordances and articulations that entail design, attention may be given to how these processes and expressions are made material. Regarding scenario thinking, this process diagrams, objects, and activity canvases that inform an applied scenario-driven approach to futures by design.
We refer to this approach as 'Compositional Methodology by Design Research'.

We move toward a series of transformational actions and present the pragmatics of morphogenesis by making a series of diagramming, artifacting, folding, abstracting, abducting, transducting, and transposing. These methods by design

1	Spatial positioning of information in a ' black hole'	Digital illustrations were generated during the design process of Configuring Thematic Scenarios. Through an abductive visualization technique these illustrations were compositionally overlaid and centered during a layering process (Dudley-Smith & Whiteman, 2020).
2	Deductive abstraction	The line weights were removed through a deductive visualization technique and an abstract shape emerged that is a representation of the negative spaces seen in the first compositional illustration (Radnofsky, 1996: 385).
3	Imposing information	The 'black hole' becomes the canvas for positioning and relationally mapping key words that are on theory, approaches, concepts and methods from design, foresight, futures, sustainability and scenario focussed literature (Newbury, 2011: 651).
4	Nesting and creating overlaps	Grouping the key words through boundary lines indicates five distinct overlapping concepts (Newbury, 2011: 651) that relate to their theoretical underpinning of scenario thinking by design.
5	Presenting five methodological concepts on scenarios by design	The positioning of the five concepts with relational lines indicating how they connect to each other. This allows the easy identification of which theoretical underpinning goes with each concept to better direct and focus scenario thinking. These concepts are: making as apparatus, framing concerns, formation of anticipation, framing scenario thinking and situated complexity.

▲ Figure 1: Compositional Methodology by Design Research through Visualisation Techniques (Raymond, Morrison & Mainsah, 2022).

are directed to shaping devices related to scenario thinking (as the problem space) in order to frame scenario thinking by design research and using the design futures lexicon as an anticipatory content and discursive resource and an abductive prompt in shaping the composition of the framing scenario thinking. This is materialised as a set of interlinked compositional layering. Moreover, this layering opens out for devising elements and motions of 'becoming together' to annotate the devices, by critical textual analysis, as part of this qualitative design futures research inquiry.

Diagramming scenario thinking

Our scenario thinking devices developed concern identifying temporal thematics, configuring temporal scenarios, and assembling scenario compositions. They are intended to frame how we think about collaborative ways of futures-making and collective anticipative scenario-inspired ideations by design. By way of these devices, scenario shaping echoes Deleuze´s (1988: 49) framing of assemblages as enactments. They work transformatively as unfolding dynamic processes of arrangements and rearrangements that involve both ordering and disordering through compositional methodology by design research.

Compositional layering of methods

Following on from working with the Scenario Thinking Canvas, next, we move to work with objects in non-literal non-representational ways. The aim here was to see how to materialise further the possibility of layering concepts in thinking about scenario thinking for scenario building, use and evaluation. Layering here refers to using design techniques to superimpose critical views on thinking about materials, processes of scenario thinking.

Figure 1 illustrates a series of moves in form methods and processes that further informed the compositional methodology by and as a design activity. These moves are together a broader illustration of ideational compositional techniques. This allowed us to not only focus conceptualisation on artifacts. Instead, we were able to reverse the direction of focus from objects to layering methods in emergent methodological considerations of scenario thinking. Visualisation techniques, such as diagramming (Dudley-Smith & Whiteman (2020), were applied to highlight different ways of knowing. Furthermore, the diagrams inform thinking when relations between them are changed in the nesting of ideas and concepts and visually enforming the relations between them. Next, we briefly go through the five moves that were central to materialising how to think about thinking in relation to scenario building.

These steps indicate how several acts of transduction, rotating, folding, diagramming, and mapping may inform the methodological process of Compositional Methodology by Design Research. They are materialised through a marking of relations by different visual design means and contribute to qualitative research techniques that advance an anticipative approach to futures shaping by scenario thinking (Radnofsky, 1996: 385; Smith, 2020: 32; Lury, 2021: 5).

The issue of context is highly central to Lury's conceptualisation of composition as the way methods work with problem spaces. Compositionally, we suggest that scenario devices may help us understand and envision social and environmental challenges in a way that positions design methods as approaches to societal complexities and as they align with speculation, anticipation, sustainability

and long-term futures. This is so where the scope of futures by design is presented in socio-ecological systems, strategies, services and product innovation.

The three scenario devices we framed above align with applied notions of futures by design. They are about thinking about ideas of futures that are informed by, concerned with, and affected by a collective, both human and non-human, related to systems, service and product scales, and where futures are affected and affect multiple sectors of society.

Consequently, these three scenario devices bring futures by design back into the present and into the public domain through acts of collective realisation, materialisation, fabrication, fabulation and the like. Surfacing the issues brought forward from an anticipatory futuring by design approach allows these three scenario devices to be put to work and to perform in ongoing transformations of the public sector.

Conclusion

All in all, compositional methodology by design may be understood as an anticipative approach to futures shaping in and via scenario thinking. Acts of making may then also extend into practices and dynamics of scenario building, use and review - and reflexively back into scenario thinking and new and revisited problem space identification and related and emergent processes of methodological recompositioning.

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5.
Scenarios and Speculation in Futures Worlding
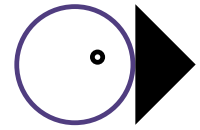
Scenarios and world-building

BY Manuela Celi

I've been working with scenarios, design and futures for quite a number of years now. What scenarios enable is a world-building. This is about the ability of bringing together different stakeholders to imagine and produce images of the future that can analyse the possible energies and resources in a certain direction (see also Ramirez et al., 2011).

Scenarios are made by different layers. Here first, we can underline that there is always a mediation between constraints and opportunities. Second, scenarios is effective when it grasps opportunities by identifying trends that might be influential and actually are only seeds. Without losing the perspective on the mainstream that is unlikely to stop happening, as it is difficult to influence many people, a mega trend is unlikely to stop. You surf the bigger trends and try to understand how the small seeds can be transformed into an opportunity and connect them with the stakeholders who might be interested in taking part in this possible direction, a different sort of growth.

We need the capacity to translate and make visible the values that underlie and support that particular image of the future. Designers have some particular ability to make meaning visible and maybe concrete. This is because visualisation, aesthetical qualities can be used for communicating and highlight those particular values as they can be more understandable than other modes of communication [→ SEE **FEATURES 8 - 10**].

In my experience the earlier practice described by Peter Schwartz (1991) in *The Art of the Long View: planning for the future in an uncertain world*, step by steps what you need to go through to design scenarios for futures change. He first points out that in Horizon Scanning the most crucial point is about being critical about identifying the most important, key factors that affect and will affect our decision into the future. For example, think about energy issues and how they are connected with war or to the COVID-19 pandemic.

Probably these highlights represent not only a trend but also constraints s they will not be avoidable. But then what you have to do is go to what possible direction and different decisions can you take given these very important issues that will affect us and present different consequences. Who will impact them?

Then there is the topic of the driving forces. These are the possible directions you might take. The theme is that once you have made horizon scanning, and different forces and direction you might take, how can you imagine different possible worlds that are determined by choices connected by the possible directions and which values they represent and what kinds of possibilities they open out for. Here we may make a digression of the use of the timeline that is inside the image here. The timeline is a support to understand and communicate visually how a series of events may be started in the past have grown, materialised and transformed along the timeline and how they can grow, collapse and follow depending on the evolution and direction we imagine. The timeline is a kind of support to help us imagine what might happen depending on how powerful the direct forces we are taking into account become.

The possibility to visualise these different outcomes in the timeline also help is in taking a position in understanding what sort of position and which stakeholders can help us change that possible direction and, as a final result, to imagine what kind of scenarios can enable those possibilities leveraging on some particular values we want to highlight. This also corresponds to different communities we might want to involve in the process of transformation and in understanding what kind of policy and politics can support a certain vision.

The map we use for creating the scenarios is an instrument to test correspondences, opportunities and the 'verifiability' the generates scenarios. You have to produce many scenarios to find the right one! It's really a testing tool. You need to sees if it works or not and what kinds of words it generates and if they are desirable or not. Sometimes you don't want them to be desirable - you want to generate a dystopic context to raise awareness. On another occasion your aim is to build desirable worlds and words and trace possible directions for transformation. In that case, it is also important to create a proper narration that supports your story if you want to involve the desired community and stakeholders.

Observations

Without the speculative, in my view, we won't get results. It's not an engineering system and ingredients. We need the speculative side because it is the only one that pushes you outside the borders. How can you change perspectives if you don't have the entanglement with art and imagination?

The Italian writer Calvino, referring to Dante's *Divine Comedy*, mentions something arriving from heaven. Calvino brings us closer into recognising that we cannot control things, and says, to paraphrase, that 'Fantasy is that place where it rains inside.' I love that. Calvino's chapter on correctness, on propriety, in *The American Lessons*, does the opposite. It takes into account what are imprecise elements.

Here I see that in our design futures literacies we need to move out of our comfort zones. We need to foster fluency. And we need to join up the dots. And when we do that we need to acknowledge there are differences in perspective, for example with our student Sofia from Argentina, who is actually from Patagonia ... in ways we make knowledge through designing and how we work, with methods and tools.

Learning design futures through scenario generation

BY Manuela Celi & Ammer Harb

**UNIT 06
SCENARIOS GENERATION**

Co-funded by the
Erasmus+ Programme
of the European Union

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UNIT 06 - SCENARIOS GENERATION

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DESCRIPTION

This unit introduces the concept of scenario generation in Design Futures. It provides Educators with the theoretical basics of scenarios, their aims and rationale. The unit explains the basic pillars of scenarios reflecting on their impact and readiness for development.

The unit is divided into four sections. The first one is defining scenarios as terminology in design futures, the second is the relevance of scenarios to design futures, and the third is the typology of design futures. The last part is the positioning of scenarios within the design process.

This unit is concerned with the theoretical framework of scenarios. While unit 7 "Scenarios' development" is concerned with Scenarios as a process. This unit answers What and Why Scenarios while unit 7 tackles How scenarios

AIMS

The aim of the Scenarios units (unit 06 and unit 07) is to help students build the necessary knowledge needed to develop design scenarios. That aims of this particular unit as a theoretical foundation to scenarios is to

1. Supports you in identifying scenarios' structure and foundational pillars. The purpose is to gear students with the basic elements of scenarios as a structure so that they reflect on their design researches or projects.

2. Identify the different types of design futures scenarios.
The aim is to provide a pool of possibilities and different typologies of design scenarios. What type is relevant to what purpose? When should a specific type be used instead of the others?

3. Learn how to generate design futures scenarios. Synthesizing the gathered future intelligence and putting them into

COMPETENCIES

Anticipatory Competency
The unit develops competency and skills for students in anticipating futures. It develops skills in understanding possibilities and projected timelines through scenarios generation.

Strategic Competency
Scenarios generation and futures trajectories help students to build strategic thinking skills and understanding of complex future situations.

Critical- thinking Competency
The unit develops critical thinking skills by unpacking and reflecting upon future possibilities. Scenarios encourage students to break down the elements of the present, identify patterns and project possibilities.

DEPTH OF DETAIL

LEVEL 01 – BACHELOR
Scenarios can be implemented in Design futures bachelor courses in order as contextual platform to position design projects within.

LEVEL 02 – MASTERS
In master's level, scenarios can be used to tackle complexities of future issues in order to develop students' awareness about global challenges.

LEVEL 03 – PhD
In PhD activities, scenarios can be used as a tool to envision possibilities, test it with experts or target users as a way to build knowledge through reflection on possible futures scenarios.

EXPECTED LEARNING OUTCOMES

A. Knowledge and understanding	-Understand the notion of design scenarios -Identify the different types of scenarios and use them adequately within the needed design process -Understand the concept of futures plurality and alternative futures.
B. Cognitive Skills	Develop the intellectual skills of anticipation and speculation for alternative futures scenarios.
C. Practical Skills	Learn how to generate scenario in a design project.
D. Generic Skills	-Understand speculative scenarios and design fiction proposals
E. Collaborative Skills	-Develop co-design and collective thinking skills about the futures

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Anticipatory learning with scenarios

BY Manuela Celi & Ammer Harb

UNIT 06 - SCENARIOS GENERATION

ROADMAP AND CONNECTIONS

● The yellow color indicates the position of the current Unit.

UNIT CONTENT

01. What is a "Scenario" in Design Futures?
Definition, positioning and introduction to the unit

This section is concerned with what does the word "scenario" mean in design futures practice. The aim is to disambiguate the meaning for students and to facilitate the understanding of scenarios as a pillar in design futures practice.

Scenarios were actually developed to imagine possible visions of the future so that they be used as a tool for decision making and to map the possible implications and consequences of particular decisions (Wack, & Shell, 1970; RAND). Scenarios are built on constructed plots, at which the future can be imagined and experienced (Schwartz, 1991), they can be the representation of a future vision and they can answer the question of "what would be if?" (Manzini & Jegou, 2000). They are an elaboration of meta-projects in the form of storytelling.

Scenarios can call the attention in a persuasive and dramatic way to the wide probabilities and possibilities of the futures that can or might be considered. They accentuate and highlight the interaction between the psychological, social, economic, cultural, and political factors. Scenarios can be used as artificial "case histories and "historical anecdotes" to make some instances of situations that don't or didn't exist. (Kahn, 1967) Scenarios can be considered as a bridge between the analytically oriented foresight or planning and the creative visions of the future (Celaschi,2007). This is the intersection between design studies and futures studies where "design futures" as a practice lies.

02. Disambiguating the term

When it comes to scenarios, there are many interpretations that often gets confused with each other and sometimes used interchangeably. This section aims to showcase some of the different definitions for scenarios. The aim is to further the knowledge and understanding of the students about what does a scenario really mean.

UNIT CONTENT

A list of different definitions in a chronological order might be needed to distinguish the differences as follows

AUTHOR	DEFINITION
Howard et al., 2002	"Scenarios are 'sketches' of use that capture the context within which a system is used, the human actors involved and their objectives, the sequence of relevant actions and contingent outcomes. Though they can take many forms (e.g. storyboards, formal symbolic representations) typically they are encoded as textual 'vignettes', capturing a few moments in a user's life."
Ogilvy and Schwartz, 2004	"Scenarios are narratives of alternative environments in which today's decisions may be played out."
Kok, 2009	Scenario is "a story about the future that can be told in both words and numbers, offering an internally consistent and plausible explanation of how events unfold over time."
Goodier and Soetanto, 2013	"A scenario is a storyline comprising a range of interconnected and uncertain future events and their possible consequences.
Leish et al., 2014	Scenarios are descriptions of possible futures that reflect different perspectives on the past, present and the future in order to improve the quality of decision making.
Celaschi, 2007	Scenarios are the elaboration of meta-projects in the form of storytelling, of one or more possible futures, aimed at defining the trajectories of innovation to conceptualize at the stage of product development. In the design world, scenarios are generally elaborated by maps, in a graphic format, which create a sort of topographical representation of innovation allowing, through the interpretation of strong and weak signals, to trace the trajectories of the project

03. Introduction to scenarios as a tool for explore futures plurality
The relevance of Scenarios as a tool for design futures

This section aims to position scenarios as a practical tool to be used in generating alternative futures. The plurality of futures and developing possible alternatives is an essential skill in design futures. In this section, students will learn how scenarios can support in the understanding of plural futures.

According to Manzini and Jégou (2000), Design oriented scenarios as a framework for "design and realization of new products and product-service systems" . In this framework scenarios can be developed on either an inductive or deductive approach, whether students can start from
a) Inductive: By developing scenarios from the gathered intelligence, signals, and trends of the future. Then, these collected knowledge can be segmented and clusters on the polarities map for example (see IO4- in Annex 01)
or b) Deductive: Students can start from the polarities created to develop scenarios on a selected polarization based on the project.

04. Elements of scenarios
Foundational pillars and structure of scenarios

In this section, students will learn the foundational pillars and structural elements of a scenario, how scenarios are formed? What are the main elements connected and how they are connected? Students will also learn what elements consolidate a strong and consistent design scenario.

Scenarios consist of several key elements that exist in one form or another in the various methodologies adopted that can be adopted in an educational sense. The basic idea behind scenarios is to collect the relevant information from a vast and wide

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UNIT 06 - SCENARIOS GENERATION

UNIT CONTENT

range of resources, then to interpret segment and organize this gathered intelligence in a meaningful and understandable form which is inform a future proposition in design. (Fahey & Randall 1998)

Evans (2003) constructs the basic elements as follows:
Current world: based upon data gathered from scanning of information forum the sources
Plot or story: what must happen for the scenario end state to arise
End State: The conditions and circumstances that prevail at the end of the scenario period
Logics: the explanation or rationale for the content of the plot

05. Rationale and purpose in design futures
The aims of creating a scenario and rationale behind it.

This section explains the rationale behind design scenarios, and the purpose of developing scenarios within a design future educational module. In what cases to use and for which objectives.

Scenarios can be used in the design driven process to present alternative and plural scenarios as well as presenting disruptive vision of strategy, product, or services:

Zindato (2016) introduced the following aims and rational for design scenarios

• To present a set of alternative futures, with their implications, opportunities, and risks
• To support and orient the decision-making process
• To involve all the actors in the same process using a common language
• To obtain a convergence towards the same option
• To analyze different stage of the process, from a context to a product.

06. Different types of scenarios
Typology of scenarios in relevance to design purpose

This section explains the different types of scenarios, what type to be used in which context and for which purpose. The aim is to provide you with the essential understanding about the different typology of scenarios.

Exploratory Scenarios

Exploratory Scenarios aim to identify new areas of opportunity, explore alternative futures. They are often used in as an answer to the enquiry of "what is there?"

Strategic Scenarios
Strategic scenarios are the type that can be used at preliminary stages of the design process, at this preliminary phase, scenario developers can put context and direction to where a design project can be directed or where it should stand.

Opportunities Scenarios
Opportunities Scenarios are a type of scenarios that has double role, one role is to create a filter through which one can identify possible trajectories of innovation for products or services. The other role is to be developed as a tool to communicate design thinking process and to re-orient decision-making process

Concept Scenarios
Concept Scenarios are the most popular type of scenarios. In design, concept scenarios can be developed to showcase a product and service as well as showcasing the context around it. It makes it easier for target audience to understand the scenarios, it makes it digestible and understandable.

Focus Scenario
Focus scenarios can be used to define a particular path, agreed-on by the stakeholders and selected by the designer, it

UNIT CONTENT

aims to define one path rather than focusing on alternatives. It aims to explore and define one context.

Testing Scenario
Testing Scenarios are the scenarios used to hypothesize and probe about a particular concept, solutions, usage, or function. It aims to test several alternatives or different scenarios so that th end users might be involved.

07. Scenarios within the design process
Positioning of design scenarios within the design futures practice.

In this section, you'll understand how scenarios can be positioned at the different stages of the design process. You'll also learn the different ways to use scenarios in a design project and how to situate it flexibly as per project objectives. Scenarios can be positioned within the design/research process at six different stages:

A. Before problem (enquiry) definition
B. During problem(enquiry) definition
C. During the definition of opportunities and trajectories of innovation
D. After concept generation
E. After electing possible solutions for product development
F. During the testing phase

While structuring the course, educators can suggest the positioning of scenarios in the overall process. Different types of scenarios can be placed as educational activities and exercises during the design process. (e.g in design fiction, students can use exploratory scenarios in the beginning of the process while they can create a concept scenario as the foundational basis of the design fiction video)

Group learning and articulating speculative designing

BY Manuela Celi

EXAMPLE: PhD group work 2022

GROUP: 08
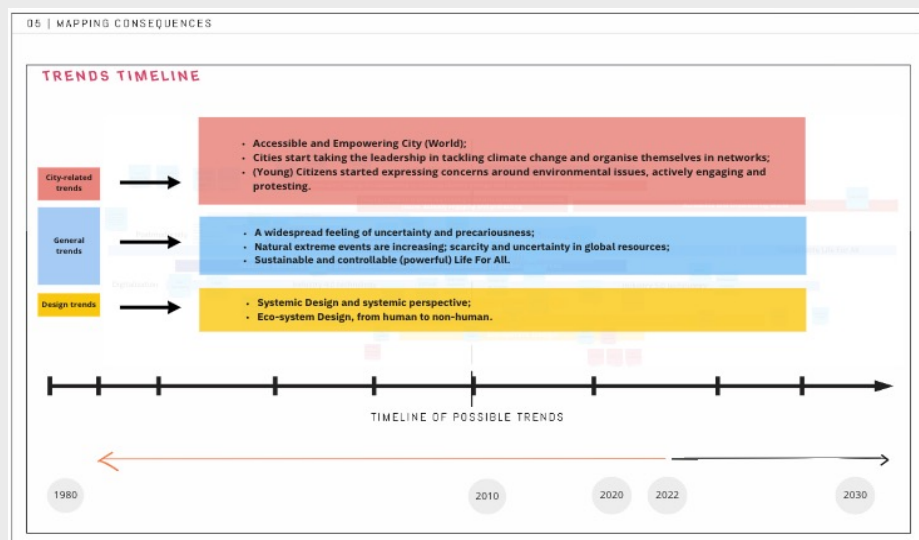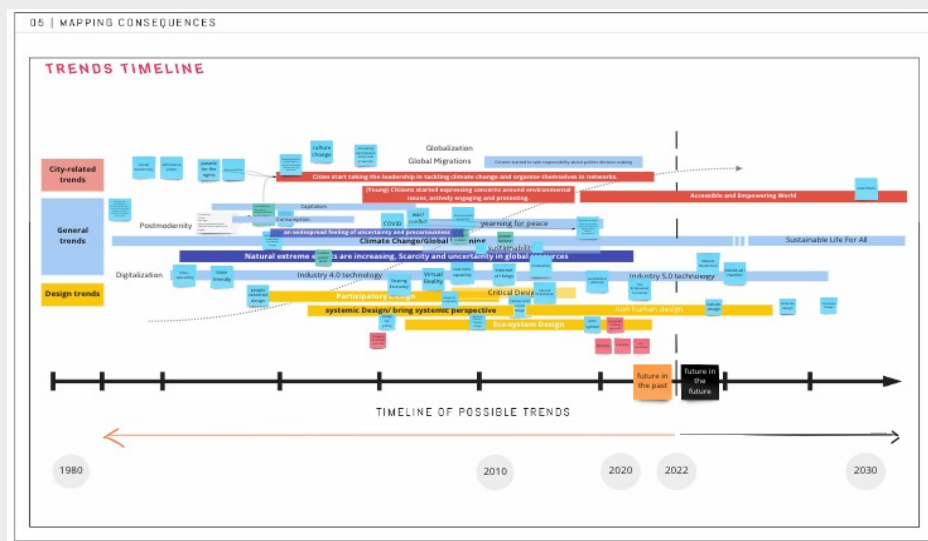

▲ Figures 1 & 2: Working with the Trends Timelines.

▶ Figure 3: The Futures Wheel.

Design in Times of Crisis was a PhD course with focus on design research prototyping. Participants in this course were PhD students going through an intellectual challenge of thinking otherwise and unknowing/unlearning to induce the production of new research models. The aim of the course was to address the crisis both as world crises and design crise. Participants went through a futures design experience and addressed various topics, such as Decolonising AI and Embodied Knowledge in Design. They were guided through a process to map futures trends in particular topics (Figures consequences that might be seen in the future (Figure 3).

The Futures Wheel opens up for the possibility to understand, visualise and be critical about forces. This is a personal step in being aware relationships and connection between the different layers and importance of the driving of the possible directionality involved in world-building. It allows you to also include in the view perhaps unexpected or different stakeholders as part of an unveiling cross-connections.

Here we see a 'flat' presentation of material in the wheel. Important here is the ability of that once we have a direction, we need to nurture the vision through a series of narrative elements that should be plausible. As the final aim of the narrative part is the capacity of involving, engaging and raising agency by the stakeholders we need certain crucial elements inside the story. The template provides the main headers (e.g. PROVOCATION, IMMEDIACY, SENSORIALITY).
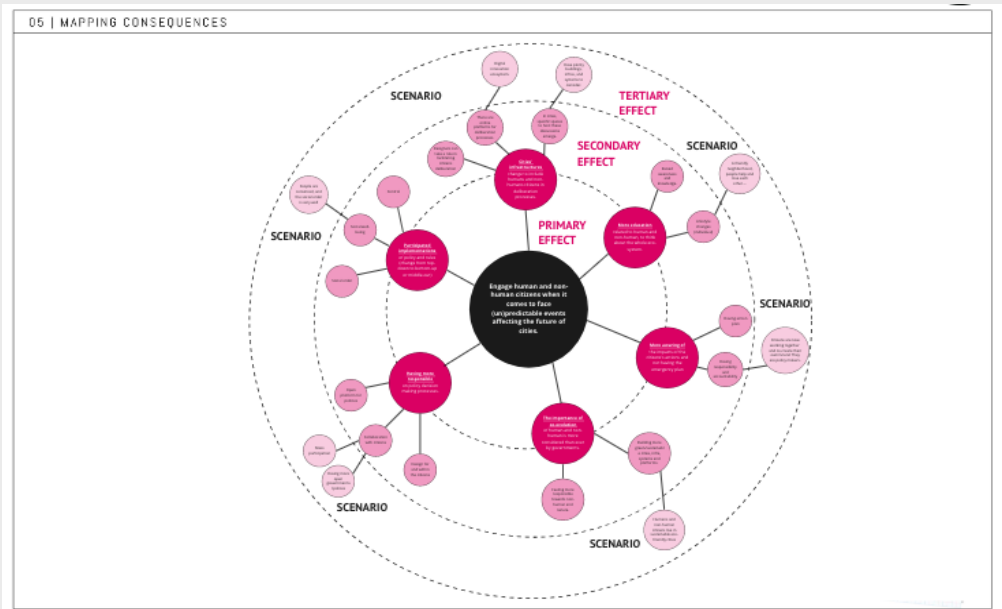
(*) FUTURES WHEEL Developed originally by Glenn, J. C. (1972) in Futurizing teaching vs. futures courses. Social Science Record 9 Further reading can be found in Futures Research Methodology—Version 3.0 - The Millennium Project
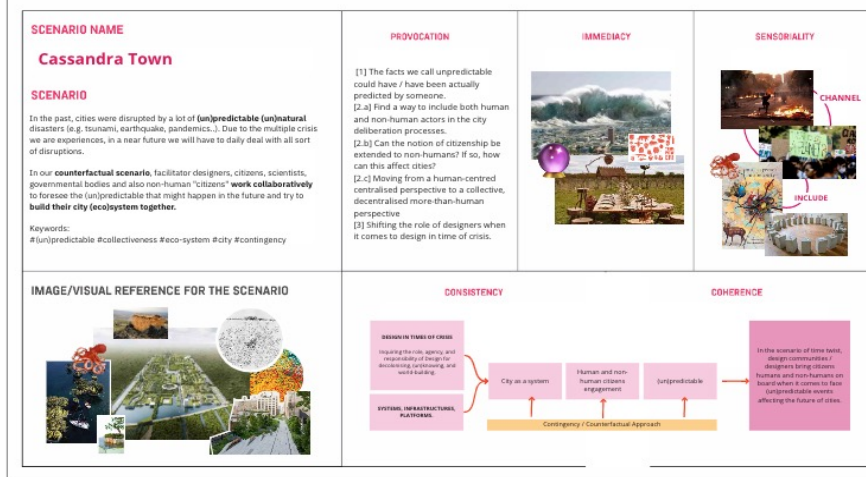
▲ Figure 4: Student group project 'Cassandra's Town'.

I've written about this in Italian translated as Design Builds Worlds and in a chapter called 'Scenarios as the narration of the possible'. My chapter begins with the following quote in The Futures of Women, Scenarios for the 21st Century (McCorduck & Ramsey, 1996: 18): 'Scenarios don't predict the future so much as they illuminate it, preparing us for the unexpected'. In the chapter I characterise scenarios in terms of two discourses: 1) the possible function of the scenarios. This includes a) a narrative and reflexive too; b) scenarios as narration to others, fabula, or we can talk about scenarios; and 3) as future mythologies. Independently from function, we have 2) narrating principles that build story, and we have selected some of these elements in this tool, also taking inspiration from Calvino.

In the image (Figure 4) we have the idea of consistency which is very important to give the scenario credibility and plausibility - the capacity of using numbers, quoting trends, that can be measurable, or are well known and recognisable – allow people to consider the context as 'real'. This has to be coupled with coherence because the extent of certain elements that gives the system a sort of international rationality.

We also need elements to keep the attention and to somehow also fascinate the audience. First of all, it doesn't have to be complicated. Hence the category 'Immediacy'. They need to be comprehended rapidly. The power of images is important. Images of the future are quick, should not be misunderstandable and at the same time need to be captivating. We need evocative and vivid images but not necessarily declarative, images. We are not saying exactly what is happening, but evoking, or 'remembering a future in the background but nurtured by the actual criticalities and uncertainties.

To support this immediacy and images we need a lot of 'Sensoriality'. We cannot use all the senses in producing scenarios, but we need to use a sort of 'synaesthetic filter' to pick up the proper images and keywords to evoke certain senses and sensibilities.

We also need a kind of opacity. The image of the future cannot be clear and lean and defined. It is blurred. We need the audience to insert their own elements, fear, possible images of the futures.

▲ Figures 5 & 6: Student group project 'Cassandra's Town'.

Also, 'Provocation' matters. Provocation might be used in different moments in scenario creation. It can be used at the beginning to raise attention. To break stereotypes. But it is also very useful when spread along the story, to insert exotic elements or stretch an aspect. Or as a way of pushing you out of the comfort zone you were creating, highlighting that every possible future is not so uniform, so that the future is not future proof. There is a recursiveness of the provocations in the scenario.

Altogether this is about the introduction of some critical turning point as another way of raising extreme uncertainties and being aware at the same time that our resilience or capacity to react to change is the real core of the story, the real aim of the story. It's pointing to the fact that the future is not about expectations but our ability to tackle and change those expectations (Figure 5).

Connecting speculative designing to future worlding

BY *Yue Zou & Andrew Morrison*

Designing and researching via speculative making

In this subsection we include material from two PhD projects that have been closely connected with FUEL4DESIGN and where futures imaginaries have been used to probe, prompt and problematise speculative making and design futures and design future learning and connections to approaches to futures worlding where the gaze is directed ultimately back onto our current contexts and making practices.

FEATURE 12 includes an extract from an exploratory study that uses a speculative organ design to explore alternative lifestyles related to olfactory, scent, perfume, bio scents, etc., to challenge aspects of the current consumerist cosmetics industry. The extract presents the main argument that multi-sensory futures may contribute to long-term sustainability by facilitating new relationships between humans and non-humans and a new way of gaining embodied knowledge [→ SEE **FEATURE 11**].

In Zou's project XIANGVEI, a speculative designed organ allows us to imagine a world that can communicate with plants through alternative perfume and its scent. The imaginary world reminds us that the unique perfumes crafted with plants are not only about our joyful human experience and social identity but also about meaningful interactions between humans and non-humans. XIANGVEI allows us to see relationships between biological and cultural attributes of smells and human and non-human. The relational thinking at play here crossing disciplinary boundaries provokes new research directions (Fry & Nocek, 2022) and helps us recognise possible alternative daily life generated for wider sustainability through the olfactory.

Working through speculatice design rhetoric

In FEATURE 12 we encounter a seemingly already constructed underwater world that has been developed to address matters of reviving marine diversity. This environment is part of a PhD project at AHO by Jomy Joseph that toggles its speculative rhetoric between an innovative master's course (Joseph, 2021a), conference papers and an exegesis comprising his thesis (Joseph, 2023), and a design fictive manual from the future (Joseph, 2021b), from which this example is drawn [→ SEE **FEATURE 12**].

As a product designer, Joseph has worked with numerous design futures imaginary scenarios to place artifacts into environments to engage us in seeing them differently, not merely as futures projections, but as actual seemingly finished and working entities. In doing so, his processes and mediated making are a mode of epistemic provo-typing that together provide a critical design centred discourse of what he terms 'refuturing design' that is centred on a speculative scenario-centred multimodal

rhetoric concerned with regeneration and repositioning of design and planetary scales. This also extends to related artifacts presented in physical exhibitions, thereby drawing us into a multi-scalar and pluriversal envisioning go how speculative can inspire rethinking about mode of making and knowing through the dialogues and events to which they are connected. Joseph participated in LEXICON workshops and discussion around terminologies, contributing his PhD core concept 'Refuturing', this making terms and their enactment through scenarios part of a design criticality for probing and problematising our ways of making and communicating futuring by design.

From the examples above, we see that design is a creative response to our world's complexities and dynamics by connecting human culture, everyday life and nature in an anticipatory way (Frost, 2016). Speculative designing emphasises plasticity, dynamics and changes of design in different times and spaces and is always in its process. Future worlding also always occurs in a processes of becoming. In addition, pluriversal futures are shaped by our current actions and choices, which can be influenced by design(s) (Bratton, 2016). Then, speculative designing is always a creative response to futural worlding.

The importance of the imaginary

These examples of research through speculative making and design inquiry are not the imaginary utopia futures we will go to or dystopia to signal warnings. Futures here are a mix of imaginations, realities, designers' attitudes and techniques (Dilnot, 2017; Margolin, 2007; Mitrović et al., 2021; Wood, 2016) that connect experiential and sensory, environmental and bio-technical knowledge and bring them back into apparent present, actual issues and potential futures through design.

These design futures can demonstrate transdisciplinary research directions (Zou, 2023), create discussion space among different disciplines (Celi & Morrison, 2017; Kuzmanovic & Gaffney, 2017) and, more importantly, build a web of knowledge and life (human(s) and non-human(s)) which offer a base for dismantling our current limitations of dealing with ecological issues (Witzgall, 2021). These design futures become the narratives, practices, research and actual actions (Ward, 2021) towards changes in sustainability.

Through creative, critical and analytical practice in tandem, they may help us stay with and think through many of the dilemmas of the Anthropocene.
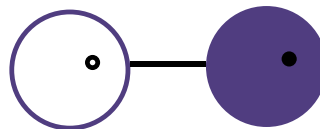
Speculative design, the olfactory and an eco-cultural techno perspective on sustainability

BY Yue Zou

PHD PROJECT: Zou, T. (2023). S*peculating on Design, Life Styles and Forms. Studies in the Contexts of Climate Change and Sustainability.* Oslo: AHO.

SUPERVISORS: Prof Andrew Morrison (AHO) & Prof Håkan Edeholt (AHO).

The goal of the XIANGVEI project was to explore alternative sustainable lifestyles related to olfactory, scent, perfume, bio scents, etc., to challenge aspects of the current consumerist cosmetics industry. In the project, I explored alternative actions and behaviours through designed organs using ecological materials to produce perfume on human bodies. The anticipatory and speculative futures of XIANGVEI may be connected to embodied knowledge, our body and our life form.

In XIANGVEI, I researched future life forms to gain insights into sustainable futures by redirecting human enhancement and rethinking the scent culture of the cosmetics industry. By this, I mean redirecting biological enhancements to sensory ones. The work addresses a number of related questions: What kinds of lifestyle elements might we need to consider to facilitate sensory enhancement that motivates sensitivity to the ecological? How might a focus on smell be taken up to realise this? What might relations between materials and environment need to be included in the work? Might there be a need to develop several parts to this work to encompass a set of key relations between the ecological, cultural and technical?

XIANGVEI is a speculative design organ for the future. XIANGVEI may be a kind of sensory enhancement in which humans can put different plants to produce location-based perfume and understand plants' language by recognising plants' radiation and computation technology.

XIANGVEI may be understood as a means to highlight sensory enhancement to understand the environment better that starts from a speculative and imaginary perfume culture beyond the current human physical-ability enhancement of solutionism. Also, the work challenges future human plastic surgeries from an Eco-Cultural-Techno view if they may play a role in sustainability.

OIL DISTILLER
Makes perfume

SILICONE TISSUE
Connects the body through
biological signals

CHIP

PROBE

Identifies
plants' radiation
and scent molecules
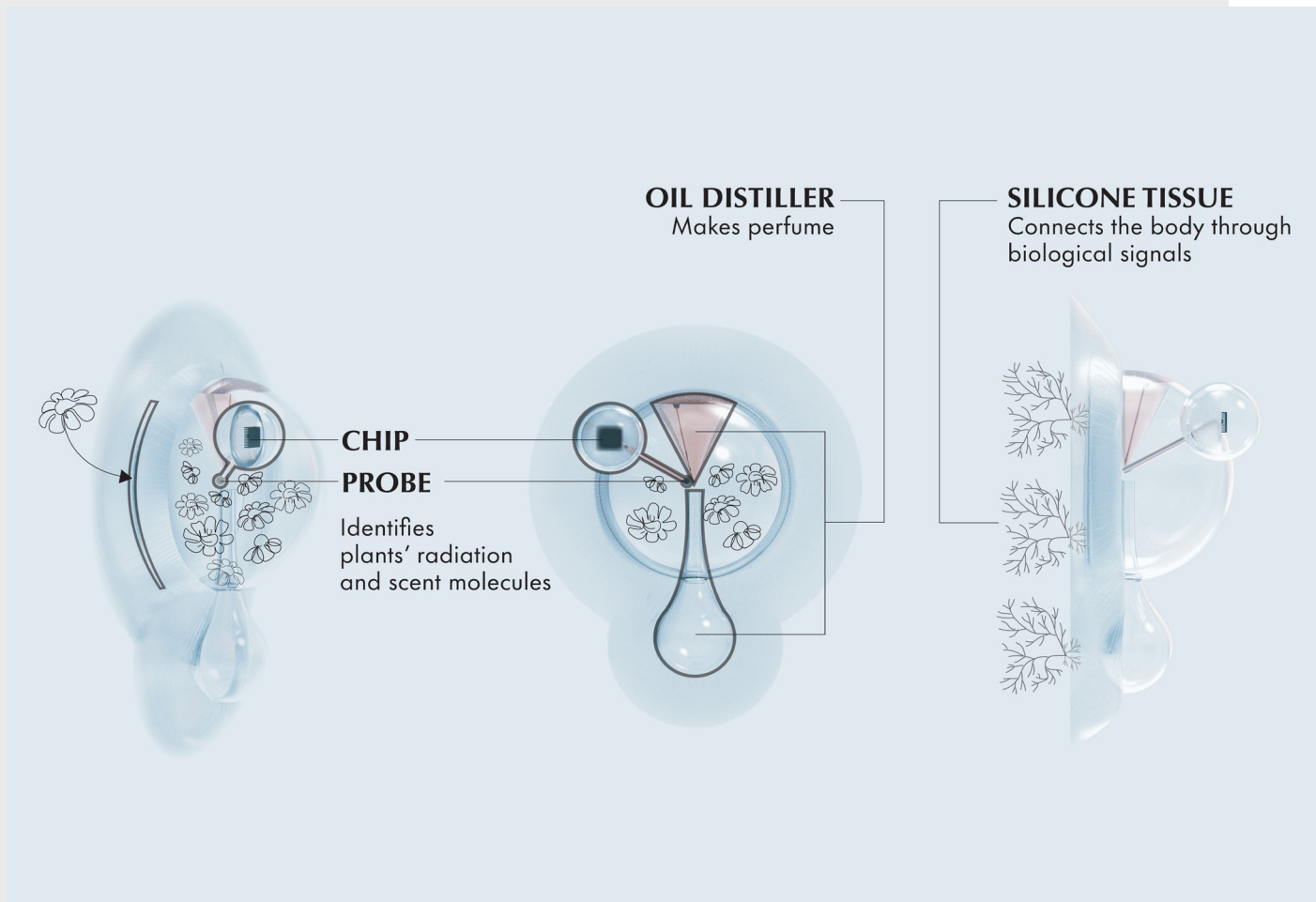
With a diffractive research process, I made XIANGVEI use as a research device to put it into different scenarios and contexts to connect different disciplinary knowledge and produce insights into sustainable scent futures.

Firstly, XIANGVEI may be a smart wearable (Figure 1) to understand the plants' signals and create scents as unique perfume. This setting was drawn up to explore and understand the potentials of technology.

▲ Figure 1: Digital model to show the structure of 'Grown Perfumer' (XIANGVEI) (Zou, 2019).

▲ Figure 2: Silicon model of the 'Grown Perfume'r (XIANGVEI) organ with its instructions for use and installation (Zou, 2019).

Secondly, I made an installation of XIANGVEI to help us experience the XIANGVEI directly (Figure 2). The installation mimicked the experience when we owned XIANGVEI and helped us rethink the value of scent embodied knowledge. Lastly, XIANGVEI may be a new perfume of sensory enhancement to understand the sustainable meaning of human enhancement. Finally, I made XIANGVEI's instructions for use and installation as a design fiction to elaborate on problems and potentials of scent future from an Eco-Cultural-Techno perspective.

XIANGVEI argues that multi-sensory futures could contribute to long-term sustainability by facilitating new relationships between humans and non-humans and a new way of gaining embodied knowledge.

How might the future smell? In what ways might olfactory relations between nature and culture influence 'living futures'. These are some questions amongst others we have perhaps not often considered as a wider futures community. Let's pause briefly and sniff the wind of the present and future. How might we detect and project, trace and pose the role and materialisations of the olfactory in a wider posthuman environmental sensibility? (Braidotti 2013, Manzocco, 2019). How might smells shape us and how we might consider the olfactory as an affordance to thinking imaginatively together about long-term, survivable eco-cultural-techno futures? In what ways might speculative design be enacted to conceptualise and mediate and offer some of these concerns?
(Zou & Morrison, 2022: online)

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Manzocco, R. (2019). *Transhumanism: Engineering the human condition*. New York: Springer.

Zou, Y. & Morrison, A. (2022). 'Sharpening anticipatory design senses for sustainable "scentory" futures'. *Futures*, 135: 102856. **Link ↗**.

Reclaimed ecosystems

BY Jomy Joseph

EXCERPT FROM: PhD thesis, Jomy Joseph (2023: 130)

SUPERVISORS: Prof. Håkan Edeholt (AHO) & Prof. Bodhisattva Chattopadhyay (Univ. of Oslo).

KALO PROBAL (BLACK CORAL)

The Electrified Composite Reefs of the Sundarbans

These electrified carbon-negative composite coral reefs get their name from their distinctive carbon-black structures made from the carbonisation of organic fibres that behave as electrodes for the cathodic aragonite deposition of seawater. Known as the 'biorock' method, it is also used for making carbon negative structural composites or socially useful production. As a regenerative strategy, it shows possibilities for recovery of coral reefs at incredible rates, even if damaged beyond repair, by combining with traditional 'seeding' and coral nurseries and aiding in their rapid recovery, making possible highly resilient and accelerated artificial reefs to also be scalable. These mangrove-coral sea walls are designed to protect from intense hurricanes and more energetic storm seasons in regions most vulnerable to climate extremes by absorbing the energy and the subsequent storm surges and sea level rise. These reclaimed ecosystems, like the climate resilience zones (CRZs) on land, are meant to rehabilitate coastal communities by stemming storm energy but also provide sanctuary for corals to survive bleaching events, revive fisheries and sustenance to coastal communities while also reviving marine biodiversity.
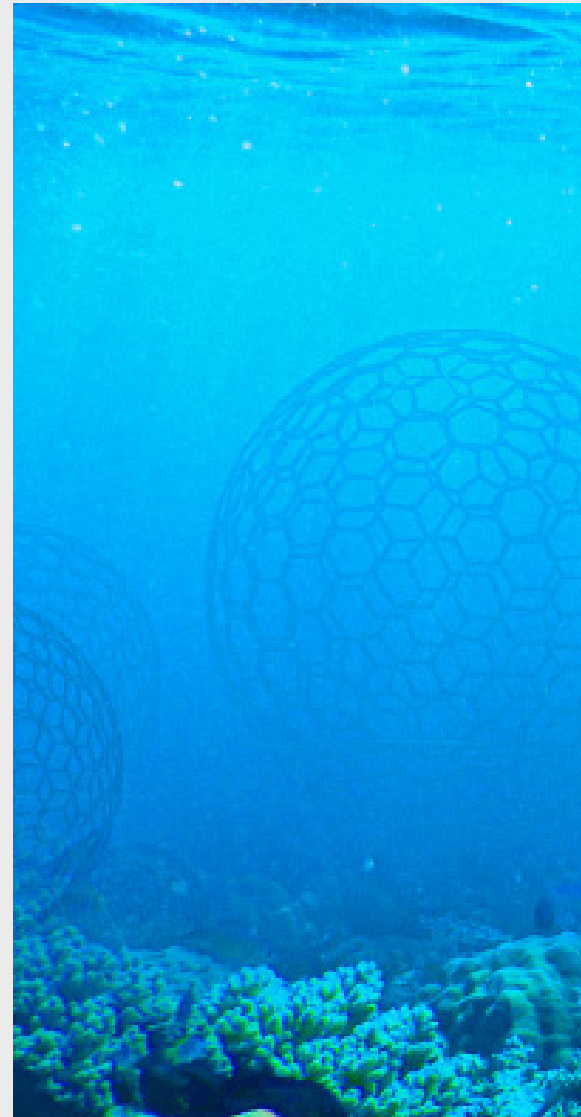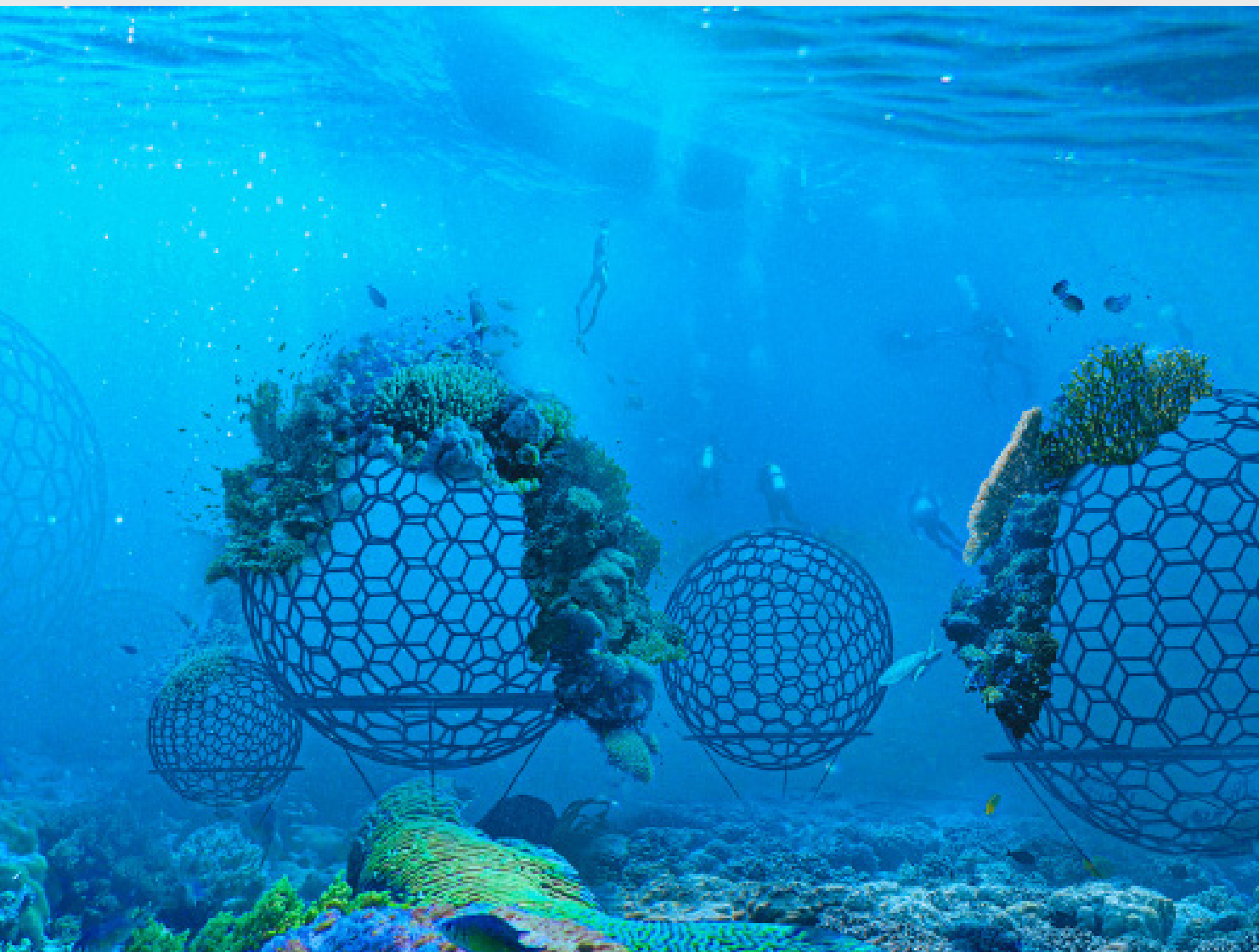
6.
Realising Actions,
Activities and Hopes
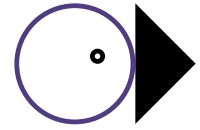
Design spaces and interventions

BY Jana Tothill, Roger Guilemany, Oscar Tomico, Guim Espelt Estopà & Mariana Quintero

Orientation

Design Spaces can be a valuable tool in futures scouting. The term has been widely used in the design community (for example, Biskjaer et al., 2014; Halskov et al., 2021; Lomas et al., 2021), contributing to it by bringing about a conceptual space where the design process happens. The definition of design spaces can be ambiguous, as they have been used in multiple ways. Heape (2007) presents them as a visualisation tool, noting that design spaces are a 'fluid dynamic, emergent and systemic whole of interweavings, traced by trajectories of expiration, experiment and change' (Heape, 2007). Compositions are created from this space of interweavings, and designed things emerge. In futures scouting through making, design spaces become physical or digital collections of experiments, reference objects, projects, products or materials that support the development of the student's interventions as action research exercises. They become a tool for gathering and framing evidence and knowledge, informed – and constantly updated – by making interventions and self-reflexivity.

Design Spaces can we take up to integrate prototypes and projects developed previously, as well as to embody personal information from self-reflexive activations as was the case in the I03 contribution to FUEL4DESIGN in the Master's course at ELISAVA: This included master's student projects as Design Spaces including ones entitled My New Me, My Augmented Context, Atlas of Weak Signals, or Multi-Scalar Mapping. (A description of these self-reflexive activations can be found at: Link).

Developing adaptable design spaces

At the beginning of the course, students were prompted with an exercise to set the foundation and start developing their Design Space. (For more information see: Link). Students were encouraged to keep updating and reflecting on it as the course goes on, adding their design interventions to it in their process of future scouting. They were asked to create an adaptable design space that can grow over time, including state of the art, weak signals, resources, and personal projects. It aids framing ideas about the area of interest. The goal is to make relationships among these visible. For instance, it can include objects/products that represent the issues that students are enquiring in a tangible way, materials that express some of the qualities of these issues

('if you had to represent your issue through materials, which would they be?'), reference projects or initiatives that are working around those issues (pictures, blueprints, etc.), reference technologies / methodologies that are being used to investigate/attend these situations of interest, possible contexts where they would be interested to place an intervention, or experiments that allow to prototype interventions. The format can be physical or digital but it is important to document it with pictures or screenshots.

This exercise attempts to give the first form to their Design Space, aiming for it to be adapted as students advance in their research. Each intervention, new inquiry or finding may provide further information and changes. These will take various forms, also related to students' particular ways of drifting during their design process (> see Volume 1, Part II I03 Futures Scouting). In this way, Design Spaces become a generative and expansive tool. This allows connection to be found among its various elements and from which students can pull interventions and design actions to keep moving forward in their futures scouting process.

Design Spaces also provide a physical or digital space for documenting. They can become a central aspect of students' design process, working as an aggregator of information, from outside sources, such as reference projects or other people's inputs, to inner data and evidence found in their research and the making of interventions and its further reflections.

Their use in MDEF has proven to be an effective tool that brings change into design making. It helps guide students' futures scouting, documents their progress, as well as informs them in their enacting of alternative presents resulting from their research and making process.

An example: Hybrid Play

In Part II I03 on DESIGN FUTURES SCOUTING, various projects from MDF students are presented. They illustrate the process of immersing ourselves in the research process and deploying interventions allowing us to enact alternative presents displaying preferred futures. Morgane Sha'ban's (MDEF 2020-21) project Hybrid Play was motivated by her concerns about some of the wicked problems we face today. She found herself in an intersection between the contemporary psychological and environmental crisis that could be coined as eco-anxiety. In this overlap, Sha'ban wondered between questions on reconnection with the natural environment, re-imagining human-nature relationships, ancestral knowledge, health, optimism or agency. (See Morgane Sha'ban's Master's repository: Link ↗).

To start tackling these concerts, Sha'ban focused on material literacy, soil literacy, and inter-learning, using them as weak signals in the initial phase of her futures scouting journey. These topics and various affiliated elements constituted her initial design space [Figure 4]. She attributed her values in the form of her vision for an alternative present, her 'fight' – or her motivation and what she stands for – and her initial weak signals. She also included her first interventions and methodologies, skills, materials, and places to be used in her design process. Her Design Space also included projects that inspired her and experiments or questions she intended to prompt while undertaking her research.

Sha'ban's Design Space evolved, not only in content but also in form, as she moved forward. Her concerns and interventions kept updating and shaping her Design Space. Her interest in new approaches to education (inter-learning, Montessori Collaboration, bio-materials workshops…) brought her to Goleman and Senge's Triple Focus (2014) methodology (see Volume 1, Part II Design Futures Scouting). This is one that is centred on ourselves (self-awareness), tuning into other people (empathy and caring), and understanding the larger world (system thinking). With this framework in mind, Sha'ban's Design Space was reconfigured into three layers: inner, other, and outer [Figure 5]. Some of the original constituents of her design space lost prominence, and new knowledge was incorporated (mainly prompted by the interventions she was undertaking).

Sha'ban positioned in the inner layer personal interest and motivations and first-person perspective design interventions. In the other layer, she imputed alternative forms of communication she had been exploring, collaborative interventions, games she had designed and tested, and people who inspired her. The outer layer had general skills and crafts, field research, protest and concerns, and people and institutions where she felt her design projects could evolve, allowing her to enact alternative presents.

Design Spaces as a new design futures methodology

Incorporating design spaces in our Futures Scouting methodology brings about a new approach. This is in contraposition to trend forecasting (Raymond, 2010) and traditional futures design approaches, such as Voros' (2003) Futures Ccne, Futures Wheel (Glenn, 2009), or STEEP analysis (Szigeti et al., 2011).

The Design Spaces methodology allows students and practitioners to position themselves and make sense of the landscape of futures they are interacting with. In futures scouting-through-making, design spaces become more than just a tool to develop and document our design process; they embrace a multiplicity of futures and visualise relations within socio-technical systems from where we engage our research.

The multidisciplinary aspect of Futures Scouting is highlighted as we allow ourselves to bring about knowledge from diverse fields in our design process. For example, Sha'ban's Design Space incorporated environmentalism, education and design. Each area provided her with various perspectives, creating a complex system that she could use to gain new knowledge and open new paths in her research. Design Spaces help navigate the uncertainties of futures design.

Sha'ban offers a great example of using the Design Space as a generative tool for futures scouting. By documenting her concerns, interest, knowledge, and interventions, she was able to continuously push further her research in forms of new collaborations and design actions, allowing her to present an alternative present on education and planetary well-being. She took the liberty to accommodate the Design Space to her own needs, proving the uniqueness and versatility of this tool. Each student or practitioner will use it differently since there are multiple ways in which we can engage in Futures Scouting-through-making (see Volume 1, Part II Design Futures Scouting).

Figure 4 ▶
Morgane Sha'ban's First Term Design Space. Master's in Design for Emergent Futures (ELISAVA, IAAC) (Image credit: Moran Sha'ban).

Figure 5 ▼
Morgane Sha'ban's Final Design Space. Master's in Design for Emergent Futures (ELISAVA, IAAC) Image credit: Moran Sha'ban).

1.0 inner – survive
1.1 **The City Forager** (auto - ethnographic experiment)

1.2 discovering and learning from local biodiversity

1.3 intune with what we consume

1.4 PlayD Wild Trek

2.0 other – play
2.1 MDEF conceptual artefacts workshop (first iteration of the silent game)

2.2 **the Silent Board Game**; confronting difficult/ abstract topics with play)

2.3 implicit communication

2.4 co-creation, learning together, compassionate play

2.5 Barcelona Montessori School children playing silent board game

2.6 Fundacio Comtal, Pere Tarres (in progress)

2.7 Bella Yurtsever, Kristina Andersen

3.0 outer – craft
3.1 rights to children; uncovering young people's agency on the planetary wellbeing

3.2 observations of Montessori classes

3.3 **hybrid craft**; personal biomaterial exploration

3.4 revealing new technologies and emergent material crafts to young people; cooking, making, learning and acting

3.5 circular lives

3.6 search for a psychological balance and ecological balance

3.7 hybrid craft redefining tools from cross disciplinary

3.8 the biomaterial toolbox

3.9 Montessori faculty (Tim, Abi, Natalie, Alicia) Montessori children (Sebastian, Georgia, Leo, Nicholas, Sofia, Lucia and BMS Primary) FabLab faculty (Santi, Xavi, Daphne, Oliver)

hyrbrid play

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On Critical Design

BY Ammer Barb & Manuela Celi

Key matters

Below, we pose an ontological question of what does it mean to be critical about design futures and further, we ask: why does it matter to be critical?

It feels sensible to define what does the word "Critical" mean before we head into explaining it from a designerly paradigm. "Critical" comes from Greek kritikós, derivative of kritikós, which means "discerning, capable of judging," from kritós "separated, picked out" (verbal adjective of krī nein "to separate, choose, decide, judge") (Merriam-Webster, n.d). It indicates the actions of dissecting, deconstructing and breakdown of elements thus be able to make judgments. From this etymological origin, Critical refers to a position towards revisiting world views and phenomena; which does not necessarily be a negative review. Being Critical describes the state of questioning, interrogating, or analysing. It refers to stance and position rather than a process.

Being critical about design has a long history. The origins cannot be defined clearly, but a very important milestone and spark would be the radical design movement initiated by the Italian architects and industrial designers in the late 1950' after the Italian economic miracle (Malpass, 2017; Tharp & Tharp, 2013). Designers such as Castiglione brothers, Ettore Sottsass, Alessandro Mendini and many more were quite inquisitive about the state of design. They posed questions through designed objects, trying to break free from the market imperatives and capitalist-led design enquiry. The revolutionary air during the 1970s fuelled these movements which have travelled to other parts of Europe such as studio Archigram in England.

However, the big leap towards polishing the practice is associated with Anthony Dunne's work in the Royal College of Art in the late 1990s. Dunne has coined the label 'Critical Design' in his book *Hertzian Tales* (Dunne, 1999) while doing his PhD at the aforementioned institution and later with his colleague Fiona Raby in their books entitled *Design Noir* (Dunne & Raby, 2001) and *Speculative Everything* (Dunne & Raby, 2013). Dunne and Raby argue that design couldn't find any social framework to hold to other than a capitalist framework. Thus, design incrementally transformed into a tool to serve and materialise corporate dreams. Design and technology turned into an unquestionable and unalterable typology where designers are urged into affirming the status quo rather than rethinking and interrogating the actions and decisions they take and to rethink what are the ethical and social implication of these decisions.

'Critical Design' and critical theory

There are affinities between the Frankfurt School of criticism and critical. Dunne and Raby (1999, 2001) note that critical theory has inspired critical design by approaching design through semiotic strategies to expose and showcase symbolic systems. Although Dunne and Raby abandoned this relationship later (Pierce, 2015), in an influential paper about the critical function in critical design, Bardzell et al. (2012)

argued that the relationship between critical design and critical theory helps in developing critical strategies. These are ones that can expose and show hidden ideological structures, adopting and transforming critical theoretical verbal methods into designing artifacts to discuss and explore relationships between users and electronic products. They mention that Dunne and Raby took up critical theory to explore the sociocultural context and user experiences through intellectually and aesthetically astonishing approaches (Bardzell et al., 2012).

Critical theory supports this approach by backing the position of radically questioning basic and fundamental concepts. This is backed by the critical theory's quality of showing the hidden operation of ideology such as analysis or narrative structures, to discussing consumption and identity. Another layer that supports adoption, is that critical theory moved from art and literature towards popular and consumer culture in the twentieth century, which creates a direct link with design.

Positioning: Why Critical?

 We position criticality in a future context as an essential skill for design students and young designers. We believe that being critical develops a great sense of meta-level understanding about the future challenges. Being critical contributes towards builds capacity and skill to actively engage in problematising design.

Dunne and Raby have made a distinction between two poles of design practice. The affirmative and critical (Dunne & Raby, 2013), Where the affirmative design practices tend to lean toward the market driven enquiry seeking profitability and supports how things are now while critical makes us think, asks carefully crafted questions. In another classification, Tharp and Tharp (2013) differentiate between design practices and classify them into four different design categories: Commercial design, Responsible design, Experimental design and Discursive design. Discursive design here indicates an overarching umbrella over all the critical design practices. It refers to the kinds of objects typology that has the purpose of communicating ideas they facilitate raising awareness about controversial, psychological, ideological or sociological issues (Tharp & Tharp, 2013: 1).

Besides being a vehicle to communicate ideas critical design is a tool to problematise and investigate design problems. In other words, the design language of making ideas tangible is used not to solve problems but to 'critically rethink the parameters of the problem itself" (Mazé & Redström, 2007: 11) So that it's being used to question and transform rather than to affirm, agree and describe. Arnall and Martinussen (2010) describe this as 'radical critical function', echoing Dunne and Raby (2005) where design is the medium for reflection on the ethical implication and impact of technology on society and culture that takes an analytical stance towards analysing and exploring emerging technology. This function can be defined as a conceptual and critical function that is countering the conventions of 'utility' and 'efficiency' as well as 'profit' and 'taste' (mazé´, 2014; Mazé & Redström, 2007: 3). This culture of design opposing the market hegemonies, emerged to question the role of designers being solely serving production and a tool to serve a capitalist discourse (Malpass, 2015).

Steering: Critical Design Futures

The interesting phenomenon that critical design and futures are good allies is that futures can push design very fast forward to its 'most radical potential' (Mazé, 2014: Mazé, 2007: 19). Future Studies creates alternatives that make future situations tangible by putting some immaterial assumptions under investigation by making them material (Candy & Dunagan, 2017). This opens the discourse about the possibilities and viability of particular policies, paths, or directions (Inayatullah, 2012).

Looking critically at the future is not meant to entail knowing the future; the real purpose is to encourage public discourse and reflection in the present about the current actions we take today [Figure 6]. The aim is to enact social change and to mitigate the implications and consequences of mindless actions we take today (Dunne & Raby, 2013). The notions of simulating change in the present or enhancing anticipatory consciousnesses are also present in Futures Studies (Mazé, 2014).

Inayatullah argues that critical futures challenge the assumption that the future once seen unalterable, can now be seen as one among other discourses. This opens the door to being able to discuss fundamental questions: What futures are put forth? What futures are silenced? And what is the price of a particular discourse? (Inayatullah, 2013).

Another interesting analogous practice that encourages social change through futures is the 'participatory futures' that has roots in critical theory in late 1960 in Germany aiming at the empowerment of humans to 'shape their futures' (Ollenburg, 2019). Design in this case can be a way to create prompts, tangible objects that interrogate the different paths of the future critically. It opens social debates today looking at changing for preferable future and environmental justice (Angheloiu et al., 2020).

The FUEL4DESIGN project is no exception. It draws on the links between futures literacy and design to gear design students, young designers, and design educators with ways to activate critical thinking in design futures. A very good example of this our FUTURE PHILOSOPHICAL PILLS (IO2) that are 'a curated set of philosophical insights, concepts, ideas to use to think about futures. They offer packaged critical lenses that interrogate, challenge and unsettle established assumptions around futures. They mobilise design practice and projects (existing or in the making) by disrupting, amplifying, and critiquing ideas around futures'. (FUTURE PHILOSOPHICAL PILLS, FUEL4DESIGN, 2022).

From our workshops and design courses conducted during the project, the Pills worked very well in making their users, rethink and challenge their choices. It helped them in changing their mindsets, understanding, and perspectives about future challenges. The Pills work to catalyse the process of shifting the mindsets of their users to see alternative views for our current world. An methodological example for this is when the users of the Pills challenged the envisioned timeline of possible trends and then challenged it by the crises cards to see what happens when this foreseen crisis occurs. Their point of view about the timeline changed dramatically.

Figure 6 ▶
Embryo (2022)
by Ka Chun Chow,
Anna Dondini,
Nuño González
Rebaque, Elisa
Melodia, Niccolò
Maria Oliva, Elena
Valle, Zane Xie.
(Image credit:
same student
group). Concept
Design Studio,
MSc Integrated
Product Design,
module: PoliMi
Futures' Fictions
2022, Politecnico
di Milano.
Led by Assoc
Prof. Manuela Celi
and tutor Ammer
Harb.

Design as Critical Agent

In the context of design and futures literacies, critical refers to positions and a standpoint a designer and designer-researcher might take towards an issue and what motivates a practitioner to tackle a critical design project [Figure 4]. In the FUEL4DESIGN project, being critical about design became an essential intellectual capacity that we sought to foster. It is a crucial skill that we urgently need to gear young designers with in order to challenge future uncertainty. We see design as a 'critical agent or catalyst'. This offers us a concept to steer the process of designing for future context. It helps young designers to problematise a future challenge and look at the hidden and intangible sides of it.

In the context of design and futures literacies, critical refers to positions and a standpoint a designer and designer-researcher might take towards an issue and what motivates a practitioner to tackle a critical design project.

> *Since communities are largely affected by natural disasters, permanent migration is the normal state, everyone is prepared to pack up and find a new place to live in. Embryo allows the development of protected species to repopulate the ecosystem while also preserving those at risk, once the specie is fully grown it is released. The packaging provides all of the necessary information, its can-like design evidences a division between society, rather considering human beings higher than other species, or humans coexisting with them. (Description of Embryo project).*

In the FUEL4DESIGN project, being critical about design became an essential intellectual capacity that we sought to foster. It is a crucial skill that we urgently need to gear young designers with in order to challenge future uncertainty.

We see design as a 'critical agent or catalyst'. This offers us a concept to steer the process of designing for future context. It helps young designers to problematise a future challenge and look at the hidden and intangible sides of it (Figure 5).

As mentioned, the goal of design as a critical catalyst is to steer futures towards sustainable futures and to enact social change. We argue that criticality in the context of design futures is a way to analyse the present, reflect upon the actions we do today thus to be able to propose alternatives for the future.

Critical design futures is not about introducing dystopian visions of the future; it is about mapping the implications of the status quo and showing where it might lead us [→ SEE FEATURE 13]. The actual core of the critical catalyst is giving designers the ability to dissect, understand and interrogate issues and topics that design usually overlooks. This is how design as a critical catalyst might help in avoiding particular future paths thus leading to better and sustainable futures.

We conclude this section by positioning the FUTURES PHILOSOPHICAL PILLS (FUEL4DESIGN, 2021) and the Critical Catalyst (Celi & Harb, forthcoming) as examples for how design can be used as a critical catalyst in the design process for a future context and how it can be driven towards enacting social change. We see these approaches as reflexive devices rather than prescriptive methodologies or linear processes, they foster triggering critical enactments throughout the process of design. They support and facilitate designers going through the process. They affect the process at all stages and help to problematise, interrogate, and define aims and motivations.

The approaches we present are also meant to challenge how one might think about design, challenging our assumptions about the future and conflicts with pre-set expectations. They foster questioning, debating and problematising future challenges.

PoliMi PhD project

GROUP: 5

YEAR: 2021

TEACHER: Manuela Celi

STUDENTS: Alessia Pinna, Clarissa Cuoccio, Eleonora Pisani, Elisa Bessega, Heitor Lobo Campos, Ivana Marušić, Lexing Xu, Matheus Garay, Xinyu He, Yuchen Song

TAGS: Control. AI. Socialisation. Relations.

Mimesis

Born out of the need for reducing the awkwardness and insecurity of meeting people in the physical world, Mimesis is a facial device that pairs AI systems with neural stimulations of muscles allowing the control of facial expressions that look natural, the AI guarantees an understanding of the social patterns of behaviour. A second device is held in the hand and establishes a connection with another person, acting as an extension of the nervous system and helping you interpret the received sensation, allowing you to control the intensity of feelings.

7.
Close

BY Andrew Morrison

Learning in and as flux

In the context of the unthinkable, qualitative research researchers take risks that extend social norms and move beyond authoritative expectations. Ideally, scholars and learners move toward the unexpected, enabling researchers to meet the 0ther and experience other ways of knowing. (Koro, 2016: 173)

In the life of the FUEL4DESIGN project between September 2019 and September 2022, at times, teaching and learning seemed adrift in a world beset by a constant and unexpected tumble of crisis, tensions and challenges. These included ecological crisis of the planet and body, socio-material challenges to movement and expression and political economic limitations and restrictions of supply of resources and exposure of market-led values and policies.

We would all be placed in the midst of a seeming flux of means and methods, material and making. At the same time, these conceptual, pragmatic and pedagogical ways of working, of learning and of coming to know, would also feel porous and flimsy. They would also seem at times to be intransigent and incongruent in the light of the challenges and changes all about us as teachers and students.

As the pandemic increasingly affected our everyday pedagogies and practices of learning design by making, then became hybrid and then a 'new normal', we would need to differently make our pedagogical responses, initiatives, facilitation and follow through. Design futures literacies in-the-making. Making design futures literacies.

This chapter has offered some of our experiences and experiments in learning design by making futures and using futures tools in design-oriented activities. These were modes of making-knowing that, despite being interrupted from their practised studio cultures, were nonetheless on the move. They took place, often tightly timed, in the ether, on screens across domestic spaces, and shared times across zones.

Often boxed in via interfaces, and, to a considerable measure, directed by the tools used and adapted, in terms of design methods and pedagogies, we found ourselves in shared platform spaces. Zoom. Zoom fatigue. Zoom gloom, Zoom doom. Zoomification. Enabling and encrusting. At the same time accentuating the physical force of embodied communication, or gesture and proxemics, movement and touch.

We worked to support students and find was ourselves as educators to motivate them in holding onto design's many sensory and situational elements and qualities. We red to facilitate collaboration in place and between diverse participants and stakeholders negotiating design processes and uses in and over time but also in place and between them. These design colleagues and students did the world over.

Our challenge was to include futures in such intensive and distributed design learning. We were literally forced to redesign a project and our ways of working together. In doing so tensions and contradictions in underlying frameworks and values in much design education became apparent to us. These are elaborated in Essay 2: Altering Prospective Design Pedagogies under the following three macro categories: 1) Immediacy-Durability, 2) Organisational Contexts-Civic Agendas, and 3) Experimentation-Articulations.

In the first tension, we were confronted by the immediate and the urgent while needing to look ahead to assembling and supporting pedagogies for long-term sustainable futures.

Second, concerning organisational contexts and civic agenda, there were Conflicting and compounding demands of navigating a higher education environment that requires economic growth to create more just institutions while supporting design knowledge exchange and pedagogies attending to the collective shaping of civic practices of future care.

Third, in working with relations between experimentation and articulation, design pandemic pedagogies generated volumes of online experience and resourcing, including informal ones, yet we felt that experiments and articulations of them may be disregarded by reinstating uncritical returns to 'normal'.

In these essays we have illustrated some of the ways we responded to rethinking and enacting futures design making that worked with these tensions. These illustrations are limited by what the project was designed to work with and how it was able to respond given it needed to both explore futures in design and design futures and provide stability and security for students under massive pressures given their learning design by making futures in the context of compounded crises.

In the events we held online during FUEL4DESIGN participants voiced similar experience and concerns, together with their own constraints in their contexts of working through similarly shared crises in which many of the problems within design education itself surfaced.

Escaping new lockdowns of pre-pandemic pedagogies

As lockdowns, mask protocols and online participation were reduced and replaced in the main by face-to-face design education, all too soon possibilities and deep issues in needed of systemic and structural discussion in design education, were bleached away by pressure so the everyday and the near automation of previous models, behaviours and activities.

This is quite understandable as part of coping with yet another major adjustment. However, ingenuity and criticality in methods and pedagogies that design students and teachers the world over had experienced and had needed to reflect on deeply, personally and professionally in order to come through the pandemic were all but brushed aside by managerial and systemic reversion to 'a new normal'.

This phrase seeped into design education from pandemic-related discourses powered by a social psychology of design pedagogy to reinforce continuity, dependability and accessibility.

But what of the innovations and experiments and of design otherwise that the pandemic has prompted and propelled?

Where we have argued that an anticipatory relational epistemology of futures in design is exploratory and emergent, we may need to implement regular, reflective pauses, formal and informal, where our critical, creative design thinking and learning to know through making and shaping our pedagogies may be aired and consolidated, at least heard and considered, but perhaps becoming fuel for further futures in our design pedagogies.

When in our project we have looked especially at futures tools and to design futuring means and methods we have needed to take up challenging questions about the philosophical underpinnings and related process philosophy dynamics and related vocabularies and semantics, points of view and tools and devices in design futures learning. Pedagogically, we have worked with the phenomena and character of new materialism in the acknowledgment of living systems and things a in developing tools and methods to probe relations between the human and non-human.

Where Snaza et al. (2016) have elaborated on new materialist pedagogies, in our work we have needed to connect such pedagogical re-attuning to the pedagogies of education, as they term it, by also working in a mode of anticipatory, relational learning where processes of design futures mattering and non-anthropocentric are paramount.

Doing so through focus on specifics, and by way of engaging learners in open and directed activities, we have also seen a need to work at a meta-design level in asking and connecting mechanisms, toolkits and ways of devising to the contexts, situations and issues that may be used to address and work through and towards. These are linked, performatively, to our approach in FUEL4DESIGN of working with uncertainty as a design learning material (Lather & St Pierre, 2013) and as an anticipatory resource for making-knowing. This is a mode of not only being together but making it possible to become so as maker-knowers and by way of knowing-by-making.

In all of this, meta-matters arise that are linked with the core tensions outlined above. Some of these we suggest may be worth further contemplation and action are often not stated, may be unheard, and may be resisted. Here are a few:

Which design schools do we look to understand ways of learning design by making futures differently? Is it too soon to see these emerge and be applied?

Whose courses actually have been transformed and tackle matters of change, learning and sustainable anticipatory systems in their pedagogies?

Why is it the leadership of design schools do so little to motivate us to use our experiences in pandemic pedagogies and where futures are an undeniable part of our changing landscapes of learning?

Where are we to source and resources changing futures in design learning and what do we not look to les staid, received and well-worn approaches and methods when as design educators and as designers of learning events and facilitation?

As the chapter in Volume 1 on **Design Education Reconsidered** presented and argued, design education is a fast-growing field and one where research by design educators is being carried out. Since we have returned to face-to-face, studio and field work modes of teaching and learning further important questions need to be faced head on:

Have we reactivated our prior assumptions and practices or have we opened out our making potential to confront the contradictions of design education and practice in the contexts of neo-liberal political economies that are at odds with many of the core needs of climate and system change?

Are our design futures literacies locked in or might it be possible to continue to activate them for further anticipatory designing?

In taking up these issues as design students, educators, researcher and professionals will need to continue to critique our own emerging narratives and practices, methodologically and pedagogically, if design futures literacies are to be anticipatory and actionable and to deliver actual options and alternatives that will motivate and engage our students in shaping shared survivable societal and more-than-human futures.
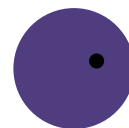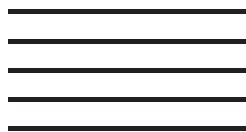
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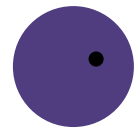
TOOLS, MEANS AND MEDIATING DESIGN FUTURES EDUCATION

BY Andrew Morrison, Karianne Rygh, Manuela Celi, Oscar Tomico, Betti Marenko & Chiara Colombi

WITH *Palak Dudani, Corbin Raymond, Vlad Lyachov, Ammer Harb, Silke Lange, Guim Espelt Estopà, Jana Tothill, Roger Guilemany, Mariana Quintero & Bastien Kerspern*

1. Orientations

BY Andrew Morrison & Karianne Rygh
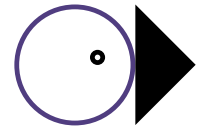
Introduction

Generative designing with reflection

Our ongoing engagement with design tools and meaning making in design pedagogy asks that we are curious, creative and critical about how we work with materials, artifacts, processes, participation and contexts of use. These are contexts that are futural in nature yet oriented toward the present and they are implicated in the past. In working towards exploring and materialising design futures in the plural, it is in the emergent and ongoing situations of use that anticipatory design pedagogies are relationally and reflexively and developed and realised. Critical takes on our legacies as well as our creative design generative imaginaries, however, may converge in our immediate present. They are influenced too by how it is that we learn, live and work in the unfolding contemporary dynamics of the now.

However, in an anticipatory design pedagogy this a present to which we may return, accompanied by design experiences from future shaping. To do so we are entangled, indirectly and directly, in processes and activities that are materialised through meta-design and recursive, abductive and transversal re-design and analysis. Not only do we find ourselves 'differently arrived' and re-positioned in a slightly out of focus poly-present of sorts. This is also a present that is uncertain, in flux and on the move.

The ways we choose, position, implement and assess the methods, means and articulations of our design futures pedagogies in relations to our contexts of teaching, learning, researching and collaborating thus orients and influences how we may know what we know. It has a major bearing on what sorts of design-enriched futures our design universities and student designers and researchers might take forward into their workplaces and professional lives. This is the case individually, collectively as a profession and in societal transformational terms as we work together in design-centred activities directed toward shaping wider, preferred, possible and potential futures.

In such an anticipatory design pedagogy, we are involved in working with transformation or 'metanoia' (Avanessian & Hennig, 2017). Drawn from Christian religious language referring to 'conversion', in terms of ontological thinking around cognition and neurology, metanoia may be thought of rather as a mode of relations between thought and language in transforming the world. It is concerned with the bringing of a world

into being. Thus it is concerned with means to becoming, processes of wayfinding and emergent disclosures of ways perspectives frame such transformation. This is a key point to emphasise when we take up design tools and techniques that we entwine with research methods and methodologies.

Anticipatory design pedagogies are geared towards supporting learners' own generative designing-with reflection. Concerning tools, means and mediations, such futures design pedagogies need to be appreciated for the anticipatory perspectives and practices they allow and promote, limit and direct. We need to be constantly aware of the dynamic relations between tools, toolkits, means and mediations as these are constructed and circulated by design and futures communities (see e.g. Engasser, (2023). In essence we are engaged with building epistemological design futures literacies.

◄ **Figure 1**
Part of the Master's in Design for Emergent Futures (ELISAVA, IAAC), using the Atlas of Weak Signals physical kit during the second week of the programme, DESIGN FUTURES SCOUTING, I03. (Image credit: Fab Lab Barcelona).

These are matters and processes of we know what we know by how we design and how we teach design. They concern how we make and select and apply tools, methods and a multitude of means, materials and media in making and shaping anticipatory design pedagogies [Figure 1]. All too often, tools are simply declaratively touted as doing and delivering; they are assembled and marketed, promoted and reproduced via toolkits.

Similarly, design pedagogies need to be mindful of the motivations and foundations of many of the tools generated historically in Futures Studies and in foresight work. Many of them embed earlier approaches to planning, strategic decision-making and management that is directive and confirmatory in nature, and where and control of different and even divergent and emergent forms of knowing and being may have prevailed over concerns with exploratory modes and means of becoming and learning central to shaping shared and more democratically distributed and experienced futures.

In looking to mediation, we lift up attention to somewhat under-developed relations between design and media and communication studies (e.g. Taffel, 2021). We situate this in respect to interaction design and preponderance of Human Computer Interaction (HCI) and the burgeoning digitisation of design and everyday life and work where anticipatory design pedagogies are intensely performative, playful and culturally articulated as much as they need to work to provide security and continuity of access and use. One of the challenges is how to hold such relational, diverse and varied approaches and methods in view and to work with them, as material and as means in dynamic anticipatory epistemologies written out of deep decolonising programme and movements (e.g. Lopéz-Lopéz & Coello, 2021). These are ways of making knowing and knowing through making. Design education is beginning to refer to and follow related processes of decolonising itself methodologically (e.g. Tuhiwa Smith, 2021). It is drawing on feminist and queer methods amongst others in reconfiguring itself in non-representational terms (e.g. Vannini, 2015). Design education institutions, in European universities such as ours in alliance and partnering with those in the 'Global South', such as in Brazil and South Africa.

These are sites and activities, venues and events, and processes and artifacts where systems and articulations are entangled, where human and non-human, political and cultural ecologies are oscillating and being better understood. They are apparent and also have potential to become in topologies and kinetic activities that are at their core design methodological in character and practice. Together, remixes and re-articulations of tools, means and mediations, need to be understood systemically and as matters of meta-design as we take up in the essay's final section. They are central to modes of action in hope, to processes of making-to-know and knowing-through-making. In educational terms, but also in societal, ecological and planetary ones, in such futures pursuits we need to ensure that our design futures aspirations remain open-eyed. They need to continue to be voiced through dialogue that engages with difference, diversity and negotiating change in which students and designer-citizens may be critically engaged and imaginatively inspired in enacting and achieving change by design (Figure 1). In all of this, design is connected with value inscription and generation, embedded in the world views and tools and methods we employ.

Key concerns

How might materials, modes of communication and meaning making be appreciated and appraised as part of heuristic, formative ways to shaping design futures literacies?

In what ways might we configure design spaces and interventions for futures learning?

What are the questions and problematics we might frame and engage with in looking into relations between tools and toolkits in shaping design futures pedagogies and literacies?

In what ways do tools need to be examined and understood in terms of their purposive and contextual design, via their participative use, and in terms of the influences and impacts they might help realise?

What mechanisms and strategies have we put into play to design tools afresh so as to offer potential insights to our understanding of how tools and mediation may work for learning and teaching of anticipatory design?

How may our exploratory practices make material key critical and discursive design aspects for further discussion and situated strategic yet open potential?

How can develop and enact design and futures as critical catalysts?

What can tools contribute to developing systemic, dynamic and fresh approaches to design futures?

How might we actively and productively take up matters methodological in decolonising design methods, tools and tactics?

Outline of chapter

We respond to these and related questions below through a set of inter-related main sections. Next, in 'Dynamics of tools, making and design futures' we discuss the need for design futures learning work to more critically look at the design and designing of tools and design futures ones, and to apply contextual deconstructions of their origins and motivations, core use situations and how design-futures relations are strongly framed and built through the promulgation of 'tools as solutions' to complex issues and less towards their being part of problem formation in the first place and alternatively being key to better problem framing and futures potential.

We then shift to ways metaphor has featured and been put to use in design and a diversity of specialist domains n a more formal academic style essay. This essay is juxtaposed with examples of our own experimental practices and descriptions as well as analyses of workshop sessions with students. Conceptualising design futures is taken further in the section that follows in which we elaborate on the role of play and the prevalence of design cards in design pedagogy and inquiry, with focus on futures. This is illustrated with different features and 'cases' from three of the work packages in the project, and shown here [Figure 2] by one completed PhD project into speculative design, posthumanism and ecologically sustainable futures (Zou, 2023).

There follows focus on the importance of mediational means in the realisation and experiential and communicative in shaping design futures literacies. This is addressed through two different takes, the first by reference to a specific student project and the second to an experimental extension of work on the DESIGN FUTURES LEXICON into it potential futures applications in co-design between its contributing designer-researcher and transdisciplinary design and design education researcher.

To draw these matters into topological relation more clearly, we take up the experience and insights on Meta-Design from one partner that had preceded and informed the project and apply and illustrate it as a means to situating and connecting perspectives and practices and indeed potentials of tools, means and mediation in shaping design futures literacies.

▲ **Figure 2**
Playing cards embodying posthumanist perspectives on speculative futures and current approaches to developing Eco-Cultural-Techno cosmetics for humans and non-humans (Zou, 2020).

2.
Making sense of entwined and unrealised relations

BY Andrew Morrison & Karianne Rygh
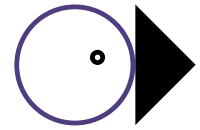
Three key issues

In such entwining, three issues matter immensely regarding the potentially transformative roles of design tools and techniques and research methodologies and methods. These issues need to be marked out as each of them does not substantively address relations between design and futures.

The first is that design pedagogies and design research tend not to easily distinguish or weave together their choices and uses of design tools and techniques and applied and situated research methodologies and methods. What is selected, combined and reconfigured methodologically and in terms of methods take on re-combinatorial features and functionalities of their own. They become different in what they allow and materialise. Little detailed work in design has actually worked at this nexus or interface, despite inspirational close studies of social science methods on speculative inquiry (e.g. Lury & Wakeford, 2012; Wilkie et al., 2017, 'inventing the social' (Marres et al., 2018) and catalogues of social methods in the *Speaking for the Social* (e.g. Knox & John, 2022).

Equally, methodological relations between Design and Futures Studies are often trapped in the predominant modes of knowing and assumptions about one another's operations and may not actually be in dialogue with one another, or acknowledge their potentially productive relational differences. Design education is generally not a topic addressed in works on design and domain disciplinary methods. Design centred publications have begun to address matters methodological and dialogue and intersections between design and ethnography continue to grow (e.g. Pink et al., 2022) including futures (e.g. (Akama et al., 2020; Pink, et al., 2023).

Second, design inquiry and its pedagogies typically do not look to a synthesising of methods from the social sciences, humanities, and computing in which design located perspectives are in the foreground. For example, work in anthropology and design (Ingold, 2013; Miller, 2017; Smith et al., 2020) and ethnography and design (Murphy & Marcus, 2013) has tended to be driven by social science discourses and methods,.

However, Drazin (2021: 237-238) has identified what he terms 'a third age of design anthropology'. This is characterised by the ubiquitous mass character of design and its roles in rethinking ways of living in political and economic systems in which design works heuristically, in dynamic flows and observations of the fluidity of human culture in design.

Design education is seldom a key feature in these writings on design the social sciences and in leading works on design and anthropology (Clarke, 2017) where changing interdisciplinary relations between objects and cultures are in focus. These may be understood as part of a larger swathe of interests, relations and metonymic links in gathering together diverse views on design methods and social science inquiry in the *Handbook of Interdisciplinary Research Methods* (Lury et al., 2018).

Third, relations between design and anthropology are fruitful yet they are also a little more complicated when futures views are added to the mix. Salazar et al. (2017) and Bryant & Knight (2019) have addressed matters of researching, less making, worlds that are emergent, changing and uncertain. Again, the ways in which knowing through designing and analysing design, with humanities infused, social science and technology studies inflected modes of inquiry, does not have design as its focal point.

This work is the task of design researchers but also design educators and graduate students as we work together and alongside one another in shaping expertise and its exchange and critical-creative assessment and mediation as part of shaping futures by design. Examples of this appear in the collection Design Futures (Candy & Potter, 2019), such as focus on makerspace platform-related pedagogies (Potter et al., 2019).

On tools, making and mediation

The interplay of tools, methods and mediations, from the technological to the imaginary, is central to the realisation of *Design Futures Literacies*. For Casais (2020:11).

> *… design tools make dense knowledge streamlined, actionable and accessible; and that they present a lot of information in a small and portable size that can be used in multiple ways (particularly card sets). Furthermore, this modality tends to communicate with images and concrete text which helps create strong mental images and aids with better learning. Tools illustrate dense knowledge with various modes of communication: symbols, icons, graphs and diagrams, eliciting conditions, behavioural manifestations, anecdotes, pictures, strategies, solutions, etc.*

Where the methodological in design making and inquiry concerns positioning approaches and techniques, methods and tools work together in the ongoing processes and interactional and performative interactive exchange of products, services and systems (e.g. Morrison et al., 2019; Bjögvinsson et al., 2012).

Drawing in master's and PhD teaching and research, and partly aligned with Stappers and Giccardi (2017), we have mapped four intertwined epistemological constituents: Research Methodologies, Research Methods, Design Techniques and Design Tools (Morrison et al., 2019).

Briefly, Research Methodologies concern knowledge and frameworks for how we do and know what we do. Research Methods address the frames and analytical strategies we deploy to carry out design inquiry. Design Techniques refer to means and activity centred design actions we put into play to carry out designerly ways of knowing.

Design Tools may be understood as more specific artifacts and devices we make and take up to carry out design and related research by designing.

In the inter-related four-way mapping Morrison et al. (2019: 271) propose that:

> *... looking at methods of inquiry in design as contextual actions offers a way of apprehending and framing the myriad of ways in which techniques and tools, actions and contexts are intertwined in generating knowledge (Sanders et al. 2010). Such a view facilitates understanding of the doing of methods that are the accomplishment of a practice. This involves the interconnection of person, place, craft, matter, and process. We argue, then, that better connections between design methods and critique may be achieved if more attention is given epistemologically to how we may conceptualise and enact design research as a making-analytical practice.*

Further, in making a four-way distinction and related paper-based activity, we argue here that that clearer distinctions need to be made between design techniques and design tools and their impact on our design pedagogies and broader futures literacies.

Tools have received considerable focus in the formalisation of design education and in diverse domains of design research. For example, focus on tools have been central to both the advance and critique of interaction design and tendencies towards technological determinism. Tools have been critiqued for not being adequately situated in discourses and practices of co-design, participative use and reflexive, situated review. Equally, Service Design has expanded rapidly in the past two decades one might argue through its use of business, marketing and management disciplinary framings through which design tools have been promoted and often not analysed more fully in terms of their purpose, motivations and affordances as design devices and artifacts, processes and mediational means. Here we may need to look to the types of potential modes of knowing participatory and co-design tools and methods might inscribe (e.g. Sanders et al., 2010) as to the types of futures they help configure or constrain in and by anticipation. Inie and Dalsgaard (2020) further discuss ways tools are used by interaction designers to 'manage' ideas, listing ten: saving, externalising, advancing, exploring, archiving, clustering, extracting, browsing, verifying, and collaborating. Missing here - and ripe for elaboration - is anticipating.

Consequently, while many design tools may do interesting or novel work when put into situate use, all too often they are presented at a propositional, directive and deterministic level rather than in terms of the opportunities, tensions and contradictions they might raise or the unexpected, negotiative paths they may open out to. Design tools have not received great attention in design education research (e.g. Dalsgaard, 2017), though they are used pervasively in daily practices and student projects, supported for example by resources such as Sanders and Stappers' (2013) *Convivial Toolbox*. Relations to tools are central to Human Computer Interaction (HCI), for example on tools, artifacts and mediations (Karana et al., 2020), and are being taken up regarding 'more-than-human' designing (e.g. Giaccardi & Redström, 2020).

As diverse domains of design go about prospectively shaping and asserting their own disciplinary and diverse identities, we need to be watchful of tools from Futures Studies that carry with them traces and forces of specific world views. At the same time - as post-humanist ecologies are rethought and exercised - our understanding of tool-context relations become increasingly important. This includes futures design affordance views, and where traditional human psychological affordances are more environmentally framed, animated and enacted.

Here tool-affordance relations are interesting and offer fruitful room for further investigation. Affordances are most often characterised, following the work of Gibson (1977) in animal ecological psychology and Norman (1988) in HCI, as being to do with perceived and actual perception via device qualities and actions that together shape meaning making in context. For Gaver (19919 affordances are not only embedded in artifacts and tools, but also in our multimodal interactions, and mediated meaning making (Kaptelinin, 2014).

In terms of anticipation, affordances are systemic and cultural: central is how design imaginaries embed and embolden mediated meaning making through the capacities and qualities we embed in the futures tools and devises we devise and apply. Here we might start to think further on 'anticipatory affordances' in the design tools and techniques we employ, for example in futures probes as tools and futures probing as technique.

Tools are never neutral devices

From the comparison of the design tools and their sources of knowledge, we developed a three-part model of information accessibility. This model summarizes three levels of communication and understanding that design students use, namely: level 1 – the knowledge from other fields other than design, often resorting to discipline-specific complex language, linear text and abstract reasoning; level 2 – the knowledge from design research that articulates design with other fields, makes evident the relevance of such knowledge to design practice but often remains obscure and abstract, communicated through linear text; level 3 – the streamlined, simplified, and actionable version of the knowledge, the design tool, more widely accessible to students. (Casais, 2020:11).

In looking into the roles and functions of tools in design and learning, and that of a futures aspect, we need to continue to ask how tools are used implicitly in processes and discourses of design knowing.

What are we to make as educators of a recent survey of design tools, methods and theories in design inquiry (Herriot & Akoglu, 2020) and to their transferability of accessibility for futures design pedagogical purposes and explorations? Where researchers, similar to our own anticipatory work in, Service Design and Public Health (Rygh & Morrison, 2022), address the tactile and co-design (Heiss & Kokshagina, 2021), how do our own tangible tool making [→ SEE **FEATURE 1**] and the application of design tools as anticipatory devices and means obfuscate or assist in substantive futures meaning making?

Tools and toolkits; relating futures tools to design futures learning

BY Manuela Celi
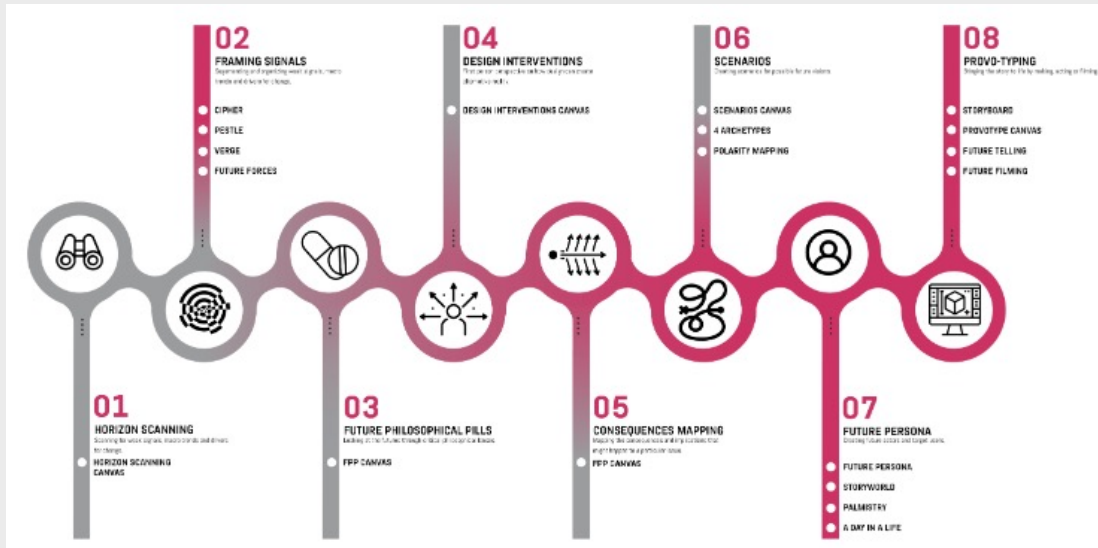
Futures Tools were selected to provide design students with access to how tools have been framed and function in Futures and Foresight Studies and practice (see I04 Overview for details) and how we might redirect them in futures in design.

FUTURES DESIGN TOOLKIT (I04)
The tools, methods and devices in this toolkit are represented in a form of:

i) Template or canvas that designers can use to identify specific aspects of their design inquiry
or
ii) A diagramming device that helps users of the toolkit to breakdown or analyse an issue or topic
or

iii) A tool that helps users of the toolkit to build and generate ideas and concepts.

'The aim for FUEL4DESIGN is to produce tools and materials that can be exploited, first of all, by teachers to organise and reframe their activities. So it was very important to interact with them and to understand if they were able to grasp this kind of knowledge from what we had and also on how to steer the content of F4D along the pathway and the process in order to fulfil the requests and needs that we addressed.'
(Manuela Celi, PoliMI, in an interview with Vlad Lyachov, I06)

TEAM | ANCA SERBANESCU, CORBIN RAYMOND, DELINA EVANS, ERMINIA D'ITRIA, GUIM ESPELT

PHD FUTURES THINKATON

PHASE 01 | HORIZON SCANNING

TOPIC STATEMENT
REDEFINE YOUR TOPIC STATEMENT AND AREA OF FOCUS

10 min

Building a collective community of practice towards scenario building and collective agency

TRENDS, CONCEPTS, DRIVERS
GATHER YOUR IDEAS HERE

50 min

Adapting service d to a global heal context, focussing on addressing antimicrobial resistance in India. Delina

What do we mean about Horizon?

TIPS AND INSTRUCTIONS

HORIZON SCANNING

Horizon Scanning is the action of exploring the external context to better understand the nature and pace of change in that context. It's aim is to identify potential opportunities, challenges, and likely future developments relevant to your topic of investigation.

Horizon Scanning is not about making predictions but about exploring new, interesting, emerging futures, as well as persistent challenges and trends today. There's no "right" at this stage, you just need to map what's going on.

01 Define your topic clearly with your team and make sure you are all having the same understanding of the included terminology. (use Lexicon)

02 Start by breaking down the elements and concepts included in the definition.

03 Look openly and divergently for weak signals, macro trends and drivers for change. You can do on-line research, check articles of journals, youtube videos, twitter debates, scientific papers & trends forecasting reports.

Split-up search keywords/elements among all the team members and make rounds of (individual research then group discussion)

TIP Use design elements whenever possible, making is never too early. Use collages, videos and paper prototyping or any other design activity you feel relevant to explore/understand trends.

TIP Give yourself sometime at the end of the exercise to cluster the concepts, drivers, or trends gathered.

product design. understanding of cinename and practice through fictional cinematic case studies Guim

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Vlad Lyachov: What arose in the design making parts of your contributions to F4D that you see as most significant to highlight and to take forward?

Ammer Harb: I think one of the most important things was the tools. It really gives the opportunity to build on. These tools could also be quite adaptive and are brought from different sources. I think that these tools are a very good platform to start with. If you are someone just starting and wanting to understand, this could become a good indicator to get into this and start providing the vision and futures thinking, especially to design students. You can, of course, update it, bring it further, change, but it is a very good starting point, I believe.

(From interview with Ammer Harb, teacher and contributors to FUEL4DESIGN PoliMi I04 DESIGN FUTURES TOOLBOX, and PhD student PolIMi, by Vlad Lyachov, I06).

◀ Figure 1: Content of the Design Futures Toolkit (I04, FUEL4DESIGN).

▲ Figure 2: Example of one student group working with Futures Tool Horizon Scanning PoliMi (2020).

In terms of design education, Casais and de Francisco Vela (2020: 11) identified four types of design tools: 1) Information-based, 2) Inspiration-based, 3) Tangible design tools, and 4) and Process-based ones. They observe that:

> *Besides making complex knowledge 'digestible' and actionable, to be successful in the design classroom design tools can and should be adapted to specific needs. Moreover, it is through their usage that they are understood and that application needs to be well explained. However, using a design tool is not designing. In the end, one of the main purposes of teaching with design tools, should be to foster students to build their one (sic) research tools. (Casais & de Francisco Vela, 2020: 12).*

Further, in using design tools in teaching and learning design will also need to look closely into how they work negotiatively in different dynamic acts of designing, whether in ideation, visualisation, situations of use and so on. Through a diversity of experience on our own part, we argue that tools need to be more fully approached and unpacked in terms of the context appropriateness, whether aesthetically or performatively. This is all important when tools are then assembled in toolkits and toolboxes and where they may be presented as 'done designs for done deeds'. Research in co-design consistently shows we need to pay attention to materiality in our tools, such as Knutz et al. (2019) point out in varied explorations of the uses of probes in shaping patient democracy.

In contrast, we go so far as to say that design futures literacies need to actively deconstruct and critically assess what we see as tendencies towards 'toolboxing'. This is not just the black boxing of tools and technologies in opaque systems and applications separate for use and users' views as has been taken up in the field of Human Computer Interaction. It extends beyond participative and promotional 'democratic' claims for D.I.Y., Additive Manufacturing and AR/VR technologies. It's also involved in teasing apart and exploring the multi-affordances and multi-materialities of physical-digital, human-non-human, technical-ecological relations and their ecological, economic, aesthetic and communicative relations and interplays in rethinking what we understand to be tools and their mediational interplays and materialisations as say new forms of services and interactions.

When looking into tools and design futures learning and related researching, there is a further need to distinguish between and question the status of the tools being sought or taken up. What tools are right for what needs, tasks or opening? Is it one that already exists and needs to be understood in terms of its design motivations and use? Is it a tool that is being re-purposed or used abductively to realise different ends? Or might the tool be newly designed and in need of a different set of watchful eyes and questions? And then we will always need to ask what is that we aspire towards in adopting and adapting tools, or in jettisoning them and replacing or redirecting our creativity and use in different directions, potentially open, risky and undetermined ones. What design futures criteria do we need to include and develop in doing all this? How might tools work as critical prompts, teasers and problem makers in processes of exploratory making? In what ways might we tangle with the pull between seemingly disparate or

contradictory affordances and mediational means that tools and their contexts of activation might bring forth, entwined and anew, differently and unexpectedly?

All of these questions may also be reframed in wider move to decolonise design in which educational and research methodologies and methods and design tools and techniques are undergoing deep challenges and part of institutional change processes. While these may themselves be contested, they seek to work to change historical and contemporary discriminatory configurations and practices. Attention is needed to how it is that we form, shape and pattern how we know what we know and what it is that they that allows us to enact and to transform. Attention to anticipatory systems is central to such change processes and tangible outcomes having real, and lasting force for marginalised persons, communities and groups.

However anticipatory cultures are also in need of methodological and pedagogical attention and design. As mentioned earlier, work remains to be done in our view generally and in terms of design futures pedagogies on distinctions and interplays between research methodologies and methods and design tools and techniques.

We need to attend to these carefully too when plural futures are also likely to be colonised and appropriated as power and preferences are exercised and configured as futures emerge and are claimed and proposed, and where they are projected and anticipated, nurtured and occupied in the hands of people previously denied reparative justice, or displaced from land and resource stewardship, for example, in wider colonial and extractivist economic forces, policies and histories. Our design futures literacies cannot not be decolonised, and continuously so, in their making and re-making. We take up these matters again in the final chapter in Volume 1 of *Design Futures Literacies* entitled Learning Futures Design Otherwise.

These matters come to a head in a design futures literacies frame when one engages with tools derived from Foresight and Futures Studies. Although these cannot be read under a simple blanket of methods and means, epistemologically so, they are themselves products of their times and the parties to which they were commissioned, but also promoted and applied. In the next section we look into this more closely and give an account of how we took them up in I04 on DESIGN FUTURES TOOLKIT.

Re-thinking tools in design futures pedagogies

Tools and their selection and gathering as toolkits that are put into critical and creative are powerful components in use design futures learning that is finding ways, seeking out possibilities and tilting towards alternative futures. Tools and their intersections and applications need to be appreciated as together forming a mode of coming to know, not as being about programmatic verifying criteria. Such a view of design tools for generative futures making ought to help us sidestep a determinist pull of tools as devices to resolve complexity and reveal solutions.

Instead, in design futures learning and teaching, tools may be taken up in our own designerly hands and critical designerly minds and analyses to support processes of

situated, mediated meaning making and exchange of knowing. They may function as prompts, help us think through and think out designs, develop objects and processes and craft and convey anticipatory propositions and projective scenarios. These may help us to open out, expose, enable, upend, catapult and problematise our shaping of futures and ways futures views shape us as designers.

There is also what we see as a 'when of tools' in realising design futures literacies. This refers to further attention being needed in our view to building capacities and fluencies in working in early phase tools use. When tools are used in workshop settings, they may also be applied in rapid iterations. The speed of their uptake may steer implicit processes productively, but it may mask needed dialogue or the making explicit embedded views and vocabularies and limit attention to wider matters of method. It isn't that the tools do the job, or fulfil the aims of the workshop. Rather it is how they are part of a wider ecology of design situated meaning making and the activities of making artifacts and their dialogical relationship to mediational processes and materialisations via variety of modes of expression and communication.

At one level this may seem obvious to design educators. This is what we do in designing. At another level, in such practices within embodied and contextually sensitive activities of futures meaning making through design we need to continue to hold open dialogical thinking and knowledge exchange. It demands of us a reflexive, dynamic activity centred awareness and criticality as to how tools contribute to or restrict acts of intentional futuring and how our performative design futures (whether as products, interactions, services and systems) allow us to review the roles and affordances of tools we have in our hands and use imaginatively.

Our understanding of tools as a key component of design futures literacies depends on the ways we explore and exercise them and through the attention we pay to their affordances and affects, their associations and applications, and importantly, how we engage them and with them in terms of their perceived, actual and imaginary implications [→ SEE **FEATURE 2**]. To do so allows design educators and students to actively position and to work with tools that are centred in a design learning through becoming frame, not only a futures foresight one or a design as delivery trajectory of tools, mediations and meaning making. There may be a richness in the design and communicative potential of tools in that they offer their users to use them in different ways to reach towards and to realise different meanings [Figure 3]. Metaphor is central to this meaning making and is the focus of the next section.

▲ **Figure 3**
Screenshots of cards in the Weak Signals card deck. Master's in Design for Emergent Futures (ELISAVA, IAAC). (Image credit: Fab Lab Barcelona).

Processes of working with tools and tangibility in design futures and services for public health

BY Karianne Rygh
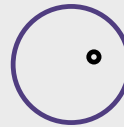
Here I'm including some notes on reflecting on working with tangible tools in my doctoral research as a product-service designers within the wider research project connected Care (C3) in which AHO participates..

See also Essay 5: Care, Engagement & Design Futures Knowing.

I began the work presented below pre-pandemic, and with a focus on tangible tools development in the context of Public Health (PH) and Service Design (SD). The public health crisis of a global pandemic that has played out similarly and differently in different countries has most definitely had a bearing on my thinking about tools and futures in designing and in my own design (futures oriented) learning.

As part of my doctoral studies and research at AHO, I have been working in the intersection between Product and Service Design. My aim has been to develop professionally rendered tangible tools to assist on processes of negotiating relations between Service Design and the provision of complex care opportunities, options, practices and futures in Public Health (Rygh & Morrison, 2022).

In order to develop meaningful contributions to the ongoing development and application of Service Design in Public Health, I have needed to work closely with other professionals in the healthcare field and to develop tools suited to needs in context, and in particular to the co-shaping of futures needs and provision of support and care for patients (see figures 1- 3 below). Heiss & Kokshagina (2021) take up the co-design of tactile tools as part of interdisciplinary problem exploration in healthcare settings.

One part of my PhD research has centred on thinking through, making and applying in use contexts tangible tools for thinking about long- and short-term futures in the context of cancer care. This work is itself rather acute in the number of medical specialists and professionals who may be involved with a patient at different points

in their journey as well as in the enhancing nature of their health and illness. In meeting with and working with a range of health professionals in the context of developing a new cancer care centre in Oslo (Norway) I have needed to embody a diverse range of needs into a set of devices geared toward shared decision-making and resource sharing around new wards, where beds themselves are a key item.

Futures of palliative care emerge and are to be realised through the availability and accessibility to overlapping and shared resources, with needs by type and volume changing over time.

I've come to appreciate that working with time, with physical and human resources often point to working in time with rather acute futures that need support for clarifying relations to resources and being able to perceive options and combinations of them. But how might one not just look at tools as functional or transactional?

▲ Figure 1: Medical professional and facilitation designer discuss how the tool prototypes can be incorporated in the various activities and which order and approach is best to meet the desired aims for the workshop. The tool consisted of ward signs (round), small (meta level) beds, large (macro level) beds, figures representing patients and plastic markers for ´tagging´ beds that could be reallocated and patients that were eligible for moving.

There a very real need to meet challenging and longer-term systems design structuring and resource planning and allocation in I've been working with what I call 'tangible tools'.

How can we devise haptic tools in facilitating and negotiating interactions between SD and PH?

Here, from my diverse experience I see that what we say and do with our hands differs. In making things and processes tangible, you get more information via the proxemic, the haptic and the kinetic amongst other senses. Ideas, actions, suggestions and choices are signalled not verbalised.

Often the delicacy of details involved in working this way is overtaken by naming and attention on tangible tools. It's as though, like the earlier and massive focus on tools in Service Design, that the tools will deliver, rather than that the tools need to be designed and that tools are filled with values and actions, choices and affordances.

As shown here, my design work offers an ecology of tangible tools in a wider ecology of working with and through needs that are patient but also PH centric. What happens in the encounters we worked towards and are illustrated has a longer term institutional and interactional futures for patients and PH professionals.

My futures-oriented literacies have thus included taking part through my own professional practice and production based expertise and my emergent designer-researcher competencies and performances. I've learned to follow through on positioning tangible tools and processes of early phase future facing facilitation. I've seen my designs informed by co-creative inputs and consultations and that they have

been taken up with the aim of real contexts of situated use and longer-term futures application. As design futures literacy, I've been designing and reflecting on designing towards a flexible set of futures, interactions, distinctions and co-operations.

This I've also written up for a large volume on Public Health and Service Design with my supervisor (Rygh & Morrison, 2022) whom I've worked closely on the doctoral research and in FUEL4DESIGN. I see further value in connecting design futures literacies in SD and PH where tangible tools and their relation to the intangible, a massive part of our shared experiences, personal and professional in the pandemic.

Relations between tangible and intangible in PH and SD are in need of further investigation. where wider systems views have most certainly come into view; where design futures making, methods and literacies are likely to remain central components in ongoing shaping of our shared futures: and, where this is likely to be done through design learning, collaboration and negotiation.
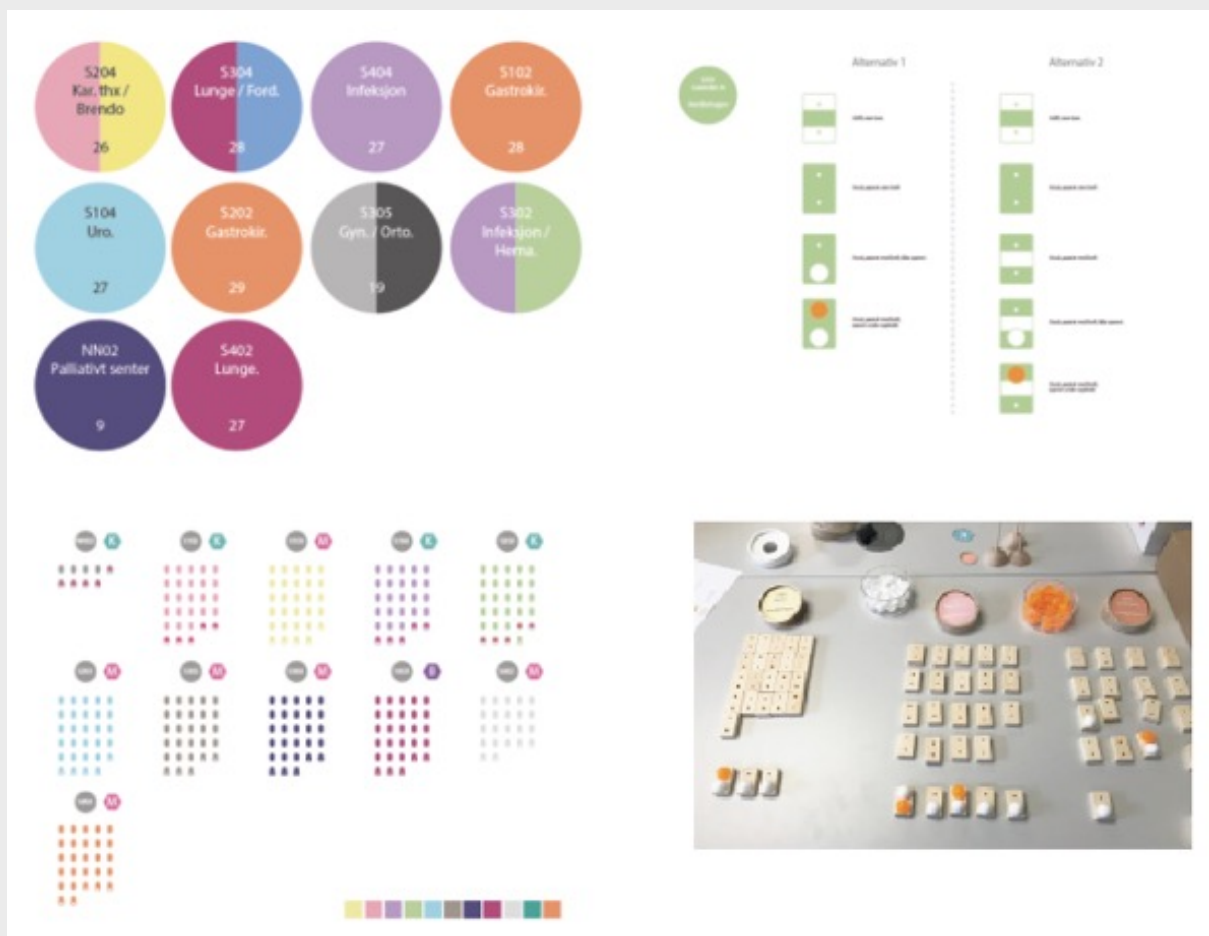
This is to look beyond seeing tools as tokenistic participatory additions (Morrison & Dearden, 2013) in not only shaping public health but working with anticipatory tools development in shaping futures together for our common good.

'In thinking about design tools and learning about and with futures, I see an association to first the part of a career as product designer. You learn that Industrial Design is not just about designing a concept on the computer and making it in the workshop. The thing to make is to learn how to make it in a feasible cost-efficient way, so you need to know production process, tools, material properties and to understand how the machine-manufacturing relations and processes affect the design. And then there are different machines too!'. (Karianne Rygh, in discussion with Andrew Morrison).

◄ Figure 2: Test-run of tools with cancer centre director, medical professional and facilitation designer. The tools were arranged on the table as they would be on the day of the meeting, with each ward being represented visually by the correct number of beds. The colour codes, names and numbers of wards and beds were checked again and re-iterated as new information and data was provided. The physical tools were then re-painted and iterated before the final meeting was held.

▲ Figure 3: Highlights of the 'Allocator tool' design process. Top left: Colour coding graphics of hospital wards to be applied to tangible markers. Bottom left: Graphic visualisation of hospital beds in separate hospital wards as a guide to arranging/placing physical tools on the table. Top right: prototyping and coordinating tangible tool activity steps & facilitation using graphics. Bottom right: testing of tangible tool prototypes with project partners. (Images & graphics: Karianne Rygh, AHO).

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3.
Metaphor, design and futures meaning making

BY Andrew Morrison & Palak Dudani

Introduction

Our current world of entangled views, versions, crises, climate and adaptive experience is deeply imbued with literalism – and attempts to challenge established facts through calls to misrepresented versions and popular demagoguery, from presidential to citizen levels. Yet were being participants in a planet in which human and non-human relations and systems are increasingly apparent, ecologically and in terms of futures. In this world metaphor also abounds. Pause a moment, we suggest, and reflect on the metaphors that have been taken up, put to use and multiplied concerning the COVID-19 global pandemic.

In this subsection, relations between metaphor, tools and meaning making in the context of design futures literacies alludes to the title of Metaphors We Live By, by Lakoff and Johnson (1980). Where it was conceived to orient us to the lived and experiential qualities of metaphor in meaning making, we extend this to 'Metaphors we design by', 'metaphors we anticipate by' and 'metaphors we learn by' [Figure 4]

Alongside a survey of what is a complex field of studies of metaphor, we encourage readers to look into material we include from FUEL4DESIGN that has been written in different contexts, voices and content orientations. We close this subsection with a discussion of key issues from our experience and some pointers to potential directions for further application of metaphor in design futures literacies and pedagogies.

Metaphors and meaning making

Design students, teachers, professionals and researchers all encounter and use metaphors in their daily lives and work. For design futures literacies - as shared pursuits, as joint processes and towards collaborative anticipatory design making – it would benefit us all to look more closely at how metaphors operate and how they are 'put into play' to realise our prospective and actual lived experiences. A quick turn to metaphor and the pandemic and climate change offers 'a window' into and through which to consider this. Already the previous sentence provides a view, a distanced stance, and a well-worn trope.

ACTIVITY

Activity A | Future Metaphors

Description: The basic concept of understanding futures is very ambiguous and, in many cases, unclear to students. This exercise helps students see the different and conflicting meanings of "futures" as a concept.

Aim: Reflection and identification of what the word "futures" means to each one?

Triggering a discussion about the futures and how we tackle future challenges

Understanding the plurality of futures

Method: Give students four metaphors of the futures and let them try to interpret and reflect upon them. **The four metaphors are:**

01: Future as a Roller Coaster on a Moonless Night: It moves in the dark; we can see each part as we come to it, and we can see some parts of where we are heading, but it doesn't help as the future is predetermined and fixed over the path.

02: The future is a mighty river: the force of history flows without stopping, carrying us with it. We attempt to change, but our attempts are just pebbles thrown in this river; they cause a momentary splash and a few ripples. But no difference. The river can change its path, but only through natural disasters or massive, concerted human efforts. By looking ahead, we can see sandbars and whirlpools, and we can push the best path through any rapids.

03: The future is a great ocean: there are many possible destinations and different paths to each destination. A good navigator takes advantage of current changes and moves carefully in frog or uncharted waters. Adapts his course to the winds of chance. This ensures you get safely to your destination.

04: The future is entirely random: Every second, millions of things happen that could have happened in other ways and changed the future. Since everything is random, all we can do is play the game, pray to the gods of fortune, and enjoy whatever good luck comes our way.

Ask questions about:

Which metaphor best describes your idea of the future? Which one is the most valid or realistic? What would be the consequences of one of the metaphors? What are the implications for society of assuming the truth of one metaphor instead of the others? Can one of them be right or wrong?

Activity B | Identifying Polarities

Description: use the gathered trends, signals, and insights about the future to create futures alternatives. Students can start from the horizon scanning exercise to identify issues and polarities of the polarity mapping method.

Polarity mapping is a way to generate scenarios by understanding the main drivers of change around the issue under investigation. The polarity mapping tool is used to identify scenarios by creating four contrasting scenarios with regard to the high uncertainty and high impact drivers.

Aim: Recognise and describe the future directions and polarities of the particular issue under investigation.

Duration: 3-5 hrs.

Method: Please refer to the IO4 Futures Design Toolkit, Polarities Mapping section.

Figure 4 ▶
Extract from I05 FUTURES DESIGN LITERACY METHODS, Unit 06, by Ammer Harb & Manuela Celi.

FUEL4DESIGN

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In her groundbreaking book *AIDS and its Metaphors*, Sontag (1988) exposed the ways metaphors of contagion and contamination, invasion and militarism generally were actively used, and predominantly in the United States and western countries (though similarly in Africa and India and elsewhere) to contain not a virus. Instead, metaphors were put to strategic and cultural work to victimise, separate and stigmatise minorities who had been exposed to and were dying of HIV, in the west notably gay men IV drug users, many African American. Sontag drew on her own work on illness as metaphor as a person, and as a woman, who had survived cancer and in relation to tuberculosis.

Concerning the HIV pandemic, a label then Republican President Reagan and his government sought to avoid at all cost, Sontag revealed, historically and for contemporary society, ways metaphors were activated to confront the frightening, unknown and challenging biological, personal, collective and cultural. Incisively, she presented how metaphor was taken up to vilify sectors of society that mainstream,

conservative moral politics and citizenry who also chose to ignore, condemn, stereotype, and evade. Decades later, Republican President George W. Bush championed and funded massive HIV education, prevention and support programmes in Africa, where poorer and poorer people have died from HIV-related illnesses and where in 2022 more people live with HIV than on any other continent.

Writing shortly after the announcement of a global pandemic, Ellie (2020: online) reconsiders the notion of metaphors as and of illness following Sontag as follows:

> *Rather than applying societal metaphors to illness, we've applied illness metaphors to society, stripping them of their malign associations in the process. It may be that our fondness for virus as metaphor has made it difficult for us to see viruses as potentially dangerous, even lethal, biological phenomena. In turn, our disinclination to see viruses as literal may have kept us from insisting on and observing the standards and practices that would prevent their spread. Enthralled with virus as metaphor and the terms associated with it—spread, growth, reach, connectedness—we ceased to be vigilant. Jetting around the world, we stopped washing our hands.*
>
> *In the weeks ahead, we are going to see a profusion of metaphorical interpretations of the coronavirus. We'll be tempted to make them ourselves. But we must keep in mind the need for language to function in a literal sense, so that we can think clearly as we respond to the COVID-19 virus.*

During the pandemic, our students have learned new terms and points of view concerning public health, such as shielding, social distancing, lockdown, front-line workers, that have highlighted relations of power and service design in national and global spheres in which product-system relations have been rewritten and revealed.

Our FUTURE PHILOSOPHICAL PILLS, use the concept of the 'pharmacon' and plays with the notion of the pill as both healing or a treat/ment and poison or trick, well-being and pharmaceutical, we have sought to 'track and trace' our own and others' conceptualisations of a pandemic, climate change and a swathe of disasters and their discursive and mediated constructions, from description to analysis. The PILLS have engaged students in working with the unforeseen, the unknown, the serendipitous in with chance-based encounters with decks of cards that allow them to see permutations of such power and position relations and to critically position them in relation to their own projects [→ SEE **FEATURE 3**].

In 'Pandemic and its metaphors', Craig (2020: online) reconsiders Sontag's work in the COVID-19 era in which 'Metaphors not only kill. They survive'. He concludes that '... even as the world appears to have spun backwards, language has the means to convey hope that it will one day spin forward again.' Metaphors are prominent in the world views we adopt and also assume, knowingly or implicitly.

In design schools across the world, students and teachers have engaged in meaning making process and co-constructive activities in the midst of unfolding, ongoing and

changing notions and experiences of crisis. We have all become more vigilant, yet as the virus has mutated so to have our own responses and behaviours. New loops, looser responses and sustained practices have, of course, emerged as we continue to learn to adapt to and to re-scale our design learning through making. In all of this, what is needed, writes Bartilotti Matos (2021: online), is 'metaphoric literacy'. This longer academic contribution this book offers and assemblage of some of the related thinking and work beyond and within design that might help us in this pursuit. (See also a special issue of the *European Journal of Cultural Studies* on a 'Cultural Commons' view of critical essay responses to the COVID-19 crisis; **Link** ↗).

Design students studying in the third decade of the 21st century have met their own pandemic and have experienced its many-sided features and tragedies, and aspirations. In different settings, they have seen at first hand how public and private health sectors respond and function, flail and fail, succeed and surmount fundamental challenges to life and to design's claims to vitality. They have also needed to adapt to deep changes to their own learning and identities as young designers in the 'conjunctural crises' (Hearn & Banet-Weiser, 2020) of the pandemic and climate change.

Humans use metaphors to make meaning by relating one thing to another, mentally, narratively and culturally. Geary (2011: Kindle) observes, referring to the poetic work of Hart Crane, that 'Metaphor is the bridge we fling between the utterly strange and the utterly familiar, between dice and drowned men's bones, between I and another'.

As conceptual and rhetorical devices, metaphors are put to use to position, differentiate, explain and communicate. They are imbued with power through ways we select and use them, avoiding here the military 'deploy', as means to create indirect perlocutionary force in utterance, and to mask, promote and reproduce predominant views and power relations.

However, this is not all, for metaphors are used in design and futures, media and learning to conceive of and to project alternative perspectives and possibilities. In FUEL4DESIGN we have therefore approached them as culturally creative and imaginative design futures material open for exploration. Even here 'a string of metaphors' and activities of teasing them out come to mind … And then, ones of speed, flow and projection proliferate in many modernist, sci-fi and techno-determinist futures.

Clearly, design future literacies need to be 'on their toes' critically speaking if our students are to be able to 'read' and 'write' futures differently by design. This is much to do with understanding the ways facts are agreed upon and circulated, but also how this circulation is also co-constructed and motivated intentionally and purposively. Work in Science and Technology Studies (STS) has shown us this in recent decades, as has related recent writing on unpacking the 'anthropocene', how diverse interests play out their preferred positions rhetorically and discursively.

Facticity and empiricism may be possible to agree upon at some core levels, while engaging with the figurative is rather more slippery, and necessarily so. Popa-Wyatt (2017: 1) reminds us that:

We think and speak in figures. This is key to our creativity. We re-imagine one thing as another, pretend ourselves to be another, do one thing in order to achieve another, or say one thing to mean another. This comes easily because of our abilities both to work out meaning in context and re-purpose words. Figures of speech are tools for this re-purposing. Whether we use metaphor, simile, irony, hyperbole, and litotes individually, or as compound figures, the uses are all rooted in literal meanings. These uses invite us to explore the context to find new meanings, new purposes, beyond the literal. Each employs different mechanisms to bridge the gap between what is said and meant.

Writing a little short of half a century ago, Ortony (1975: 51) observed the educational power of metaphors on two levels:

The vivid imagery arising from metaphorical comprehension encourages memorability and generates of necessity a better, more insightful, personal understanding. But also, it is a very effective device for moving from the well-known to the lift, from vehicle to topic.

Today, design and anticipatory pedagogies, practices and analyses are perhaps in even greater need of positioning and characterising their activities in relation to metaphor and to how it is richly addressed in a diversity of disciplines. There is room, we suggest, for metaphor and design futures to be more fully mapped and applied lest implicit matters be obscured, for example, by implicit metaphorical colonisation of our imagined, constructed, experienced and shared futures. At a linguistic level, rich insights may be gleaned from work in Critical Discourse Analysis (e.g. Musolff, 2012) on power, language multimodality and futures, that also extends to computational analysis to look beyond our perceived patterns (Charteris-Black, 2004) that are central in the functioning of metaphor in a digital age and their reach into not only social media and distributed communication but how students also increasingly need to work with digital repositories and archives (Bolognesi, et al., 2019).

Work also recently considers the role of affect bias on metaphorical representation of anticipated events (Piata & Soriano, 2022). It provides important pointers for further attention to how we might engage with our students and amongst ourselves as educators in looking into the shaping of perceived futures and the conceptual framings we conjure and repeat in their communication. This has important implications for how we work with unpacking complex, and at times, competing relations and perspectives. It prompts us to look further into the roles of metaphor in the materialisations and realisations of persuasion, preference and choices in shaping, directing, deconstructing and changing futures by anticipatory designing.

'Metaphors we live by'

Much work carried out on metaphor has followed on from that of Lakoff and Johnson (1980) whose book Metaphors We Live By accentuated relations between language, mind abstraction and experience. As its title suggests, metaphors permeate daily life and are mental and cultural models and practice through which we live. A key issue is the extent to which such metaphors are patent or latent in how we go about our existence, and for design futures literacies for how we imagine and draw futures back

into present lifeworlds. Lakoff (1993) pointed to metaphor as being conceptual and not only linguistic in nature, metaphorical understanding is grounded in nonmetaphorical thinking, plays a major role in the grammar and lexis of language, and is mostly based on correspondences in our experiences.

In 'Metaphors we think with', Thibodeau and Boroditsky (2011: online) note that 'If metaphors routinely influence how we make inferences and gather information about the social problems that confront us, then the metaphors in our linguistic system may be offering a unique window onto how we construct knowledge and reason about complex issues.' Metaphors are also realised in a design sense through multimodality, where language is entwined with or even secondary to focus on movement, speed, embodiment, taste, smell and visual communication and perception. In a more recent futures context of learning in a pandemic, Hearn and Banet-Weiser (2020) motivate for 'scandalous thinking during the conjunctural crisis'.

'Metaphors we design by'

In design inquiry and the emerging pedagogies of interaction design, metaphor has featured considerably since the early 1990s with focus on models and hermeneutics (Snodgrass & Coyne, 1992) and ways metaphor may work generatively in problem setting and processes of social policy formation (Schön, 1993). The growth of computer science and interaction design also took up metaphor in its early configurations with focus on metaphorical design (Halskov, 1994) and relations between methods and the metaphorical in information technology design (Coyne, 1995). Blackwell (2006) writes of the 'reification of metaphor as a design tool'.

Casakin (2007: 24) sees metaphors as key to design problem-solving as well as being heuristics to tackle ill-defined thinking and relates these to early level architecture education and comments on the importance of metaphors for design practice:

> *As expertise develops, along with stronger abilities in analysis, synthesis, and conceptual thinking, the use of metaphors can help to stimulate creativity in design activities. Instead of re-using known design schemas and familiar solutions, the implementation of metaphors in practice can contribute to unconventional thinking and thereby generate more innovative design products. (Casakin, 2007: 34).*

These views are supported by more recent developments in the design of interactive systems, serviced and product relations, such as evidenced a doctoral thesis by Cila (2013) entitled *Metaphors We Design By: The use of metaphors in product design*. Alternative metaphors are also taken up in critical research through design work by Pierce and DiSalvo (2017) to address questions of anxiety in the context of smart and network technologies. The take them up to 'help us see constructs such as clouds, smart homes, and personal digital assistants as metaphors by critically imagining alternatives (fog, cages, and spies, perhaps.) If we indeed want to address network anxieties along with other unwelcome aspects of interactive technology, we may well need new metaphors to do so'. (Pierce & DiSalvo, 2017: 550).

Doing design futures inquiry through metaphorical thinking

BY Betti Marenko

EXTRACTS: Edited from I05 UNIT 05

AVAILABLE: Link ↗
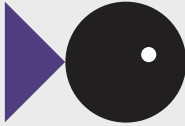
Introduction

The Philosophical Pills are an experiment in post-qualitative methodology: a way of doing inquiry that capitalises on the unknown as a field of potential, rather than imposing a blueprint (St Pierre 2019), and an instance of "serious play of rigorous experimentation" (MacLure 2020) through which uncertainty finds its way into the frameworks and methods of research to produce creative encounters with the unforeseen (Manning 2015).

This chance-based method is significant for a number of reasons:

- It is based on a radical openness to what the future may (or may not) bring, thus counteracting ingrained risk-averse tendencies to predict, control, and prepare for the future (future proofing).
- It disrupts established academic research by leading the participant through an 'unchosen' path where serendipity trumps intention, and where you are called to co-create meaning
- Finally, it wants to make a stand in favour of uncertainty and reclaim it from the rhetoric of contemporary capitalism where it is deployed (together with agility, resilience, mobility, flexibility) as a mode of anxiety inducing neoliberal governance.

Why Pill?

The metaphor of the 'pill' should be read in two ways. On a first immediate level, the pill suggests that these philosophical ideas are like active ingredients, they possess curative properties, they are easily digestible, produce tangible effects, and can be prescribed as fast, reliable, effective and targeted cure to assist design students with their inquiry.

The second layer evokes the 'pharmakon', which in Greek stands for both medicine and poison, something that according to dosage and mode of intake can be either beneficial or disruptive. The ambivalence inherent in the act of 'taking the pill' – where curative properties coexist with side effects or even with the risk of an overdose, and where the remedy may turn to poison – is an appropriate metaphor that reinforces the methodology and the ethos of using a practical philosophical approach that interrogates futures by staying with uncertainty, and indeed turning uncertainty into a material to work with.

The ethos

The Futures Philosophical Pills use chance-based interrogations into the unknown to generate opportunities to make meaning, create inspiration and build knowledge. This 'divinatory' ethos is embedded in their method of use.

By the random selection of one (or more) Pill card and of several Prompt cards users are able to build a random transversal collection of insights, ideas and references.

The way these insights resonate with each other, producing further thoughts, is a combination of the 'chance-based' together with the individual engagement of the participant – and interpretation – coproduction.

Your own way of interpreting the cards that chance has served you, and the content each card has to offer, become a narrative journey to help you reflect critically on your design practice and its future orientations.

On the unknown

... To sum up, the Futures Philosophical Pills we have produced help to imagine and enact a plurality of futures by design. They are:

- Philosophy-in action: working at the hinge between the speculative and the pragmatic.

- Transdisciplinary: Devised by a hybrid team of theorists and designers with design practitioners in mind

- They pertain to post qualitative inquiry – based on understanding becoming

- They do meta-inquiry: they use the unknown to capture the unknown

- They are diagnostic devices: to decode the present as it morphs into futures.

Crucially, while they concern futures, they are 'not about predicting, but being attentive to the unknown knocking at the door' (Deleuze 2006, 346).

▲ Figure 1: Postgraduate students from across UAL engaged in sense-making activity, 7 February 2020. (Image Credit: James Bryant).

CASES AND EXPERIENCES

Case title: Hybrid Futures Hackathon

Short descriptions: The Hybrid Futures Hackathon took place during the Digital Innovation Season – a series of talks, lectures, events and technical skills workshops bringing together critical thinking and creative expression around the theme of human-machine encounter at Central Saint Martin UAL (October 2020-January 2021). Facilitated and delivered entirely remotely, the Hybrid Futures Hackathon was designed as a platform for community-building, exchange and cross-course learning for UG and PG students engaging with the key themes of the season [How can we re-imagine human-machine encounters?]. A selection of Pills (Animism; Counterfactuals; Decolonization; Heterotopia; Post-Anthropocene; Superstition) were prescribed to mobilize students' different expertise, locate a shared theme/research question, and as a gravitation point to form the hackathon teams with the final objective to land on a research question which would inform the production of short video submissions.

The Pills proved highly versatile as they performed a variety of functions: icebreakers, brainstorming devices, critical lens for the production of the research questions. The Hackathon had a total of 40 participants, with 9 competing teams, 6 shortlisted and 4 winners. Produced by international teams working across several subject disciplines, nationalities and time zones, the videos were showcased during the Hybrid Futures symposium which concluded the season, vividly illustrating, anchoring and counterpointing the debate.

ROADMAP AND CONNECTIONS

● The yellow color indicates the position of the current Unit.
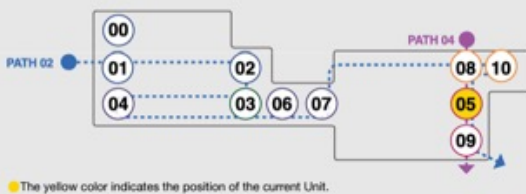
UNIT CONTENT

The Philosophical Pills use a transdisciplinary and transversal perspective to articulate call philosophy-in-action or practical philosophy (Deleuze 1988). The key characteristic of this approach concerns working at the hinge of the speculative and the pragmatic so to develop intellectual interrogations that can scaffold tangible design-led interventions which in turn are able to feedback on to speculation. It's important to stress this point: the speculative and the pragmatic are not opposed to each other: pragmatic doesn't mean practical as opposed to speculative or theoretical. Rather, we talk about speculative pragmatism (Massumi 2011): how to stay open to invention and future making (speculative) while staying with what is happening, the now, and figure out ways (methods) to enact this (pragmatism). The 'how' is crucial. It means that philosophy in action is in the business of activating ideas through prototyping techniques that engage with what does not exist yet, that turn uncertainty into modes of knowing, that use uncertainty as an opportunity to create meaning.

The Philosophical Pills are critical lenses to furnish design educators and design students alike with theoretical tools to amplify their capacity to think about possible futures, diagnostic devices to cultivate imagination and introduce different non-existent futures into the present in order to shape practice. This again is a crucial point: to connect these anticipatory skills to design – and design's many ways of seeing, interpreting and enacting the future.

Consolidate into two distinct decks of cards, the Philosophical Pills offer 40 concepts. For each of them a short introduction is available together with key reference texts – written thinking about an audience of design students. While all these terms belong to a repository of concepts that we can use to articulate multiple versions of the future, at this stage this is highly situated work which draws largely on European thought (process

philosophy in particular)

Why Pill?

The metaphor of the 'pill' should be read in two ways. On a first immediate level, the pill suggests that these philosophical ideas have active ingredients, they possess curative properties, they are easily digestible, produce tangible effects, and can be prescribed as fast, reliable, effective and targeted cure to assist design students with their inquiry. The second layer evokes the 'pharmakon', which in Greek stands for both medicine and poison, something that according to dosage and mode of intake can be either beneficial or disruptive.

The ambivalence inherent in the act of 'taking the pill' – where curative properties coexist with side effects or even with the risk an overdose, and where the remedy may turn to poison – is an appropriate metaphor that reinforces the methodology and the ethos of using a practical philosophical approach that interrogate futures by staying with uncertainty, and indeed turning uncertainty into a material to work with.

The ethos

The Philosophical Pills use chance-based interrogations into the unknown to generate opportunities to make meaning, create inspiration and build knowledge. This 'divinatory' ethos is embedded in their method of use. By the random selection of one (or more) Pill card and of several Prompt cards users are able to build a random transversal collection of insights, ideas and references. The way these insights resonate with each other, producing further thoughts, is a combination of the 'chance-based' together with the individual engagement of the participant and interpretation – co-production. Your own way of interpreting the cards that chance has served you, and the content each card has to offer, become a narrative journey to help you reflect critically

UNIT CONTENT

on your design practice and its future orientations.

This chance-based method is significant for a number of reasons

·It is based on a radical openness to what the future may (or may not) bring, thus counteracting ingrained risk-averse tendencies to predict, control, and prepare for the future (futureproofing).

·It disrupts established academic research by leading the participant through an 'unchosen' path where serendipity trumps intention, and where you are called to co-create meaning

·Finally, it wants to make a stand in favour of uncertainty and reclaim it from the rhetoric of contemporary capitalism where it is deployed (together with agility, resilience, mobility, flexibility) as a mode of anxiety-inducing neoliberal governance

Put differently, the Philosophical Pills are a response to the challenge of conducting inquiry when conditions are volatile, times are turbulent, and complexity increases. How do we attend to the multiple instabilities and contingencies of a world in continuous transformation, and how do we capture this unfolding of events within our inquiry? What kind of conceptual frameworks and methodological practices can be used to engage with becoming and all the mess it entails? The Philosophical Pills offers a possible way: by firmly knitting together theory and practice, thinking and making, design and philosophies, the speculative and the pragmatic.

This is not only a methodological but also an epistemological shift: from seeing inquiry based on the analysis of data (and the assumption that data are raw and mute and will acquire meaning only by external coding) to seeing inquiry and knowledge-production

as 'diffractive' (Barad 2007) – rooted in the entanglement of theory and practice, of researcher and research, speculative and pragmatic, and in the awareness that as researchers, educators, practitioners we are never external observers but always implicated with the research we are co-producing within the flow of events. Seen in this way, the Philosophical Pills are an experiment in post-qualitative methodology: a way of doing inquiry that capitalizes on the unknown as a field of potential, rather than imposing a blueprint (St Pierre 2019), and an instance of "serious play of rigorous experimentation" (MacLure 2020) through which uncertainty finds its way into the frameworks and methods of research to produce creative encounters with the unforeseen (Manning 2015).

To sum up, the Futures Philosophical Pills we have produced help to imagine and enact a plurality of futures by design. They are

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1: Interrogating Futures (tutor's content)

01. Introduction: Narratives of the Future
In this section students learn about different viewpoints and perspectives that can be used to describe "the Future". This section

introduces a range of ideas (from western and non-western cultures, and from other fields such as science, physics and ancient philosophy) and definitions of key terms (imagination, anticipation, speculation). The aim is to offer learners a broad understanding of the many ways in which the things called 'future' can be conceptualized and constructed culturally.

02. Why do we need Philosophy?

This section explains the methodological approach underpinning the Philosophical Pills and its philosophy-in-action ethos. It explains the notion of the 'pharmakon' (the idea that something can be both remedy and poison); it positions the Philosophical Pills within post-qualitative modes of inquiry concerning the process of becoming (rather than the essence of being) and methodologies fit for a world that is continuous (rather than discrete), uncertain (rather than determinate) and volatile (rather than predictable).

03. Working with Uncertainty

This section deepens students' understanding of uncertainty (e.g. from physics, risk management, philosophy, epistemology) and suggests ways in which it can be used as a material to work with, including the awareness of the limits of one's one knowledge. Two trajectories are offered: negative knowledge (the knowledge of the boundaries around unknown objects of research); and conjectural knowledge (knowledge that allows for elements of chance and unpredictability to enter the outcome).

04. What are the Philosophical Pills?

This section explains in detail what the Philosophical Pills are: a series of curated philosophical insights to interrogate and

challenge established approaches and assumptions around the future and catalyze research. It explains how the Philosophical Pills came to be, and the key purpose of doing philosophy in action by scaffolding the development of design propositions through the means of selected philosophical concepts with the aim to amplify, disrupt and expand existing visions. The broad objective is to push students outside their received notions, prompt them to question and justify their choice, and build increased awareness around the social construction of collective future imaginary, so that they can be exercising a more fine-tuned sense of agency and openness in relation to possible futures.

05. The decks

There are two decks of cards: the Pills deck and the Prompts deck – each containing 40 cards. By combining cards from the two decks participants can create a number of chance-based, situated 'readings', where the philosophical terms (Pills) intersect with directives, questions, provocations and nudges (offered by the Prompts). This process has been designed to open routes for adventurous thinking, conceptual exploration, and playful philosophy-in-action to amplify and disrupt the speculative-pragmatic hinge and inform design practice.

2: Taking the Pills (workshop) - see above section 06 for details

◄ Figures 2 & 3: The Futures Philosophical Pills and content from UNIT 05, I05 FUTURES LITERACY METHODS. (Image credit: FUEL4DESIGN).

▲ Figure 4: 'Do you see the glass half empty or half full?' Betti Marenko and student participants. The 'Hacking Futures - Futures Hacking' Philosophical Pills workshop at Central Saint Martins, UAL, 7 February 2020. (Image credit: James Bryant).

Akin is attention to hybrids (as noun) and the alternative techno-feminist metaphor of coproduction (as verb) in understanding interplays of digital and analogue, human and machine in ongoing developments and open, multiple and generative change outcomes (Devendorf & Rosner, 2017). These researchers write that:

> *With the continual intertwining of nature and artifice questions concerning the role of digital technology in previously non-digital domains not only prove critical to theorizing the human-machine interface, but also offer a means of designing otherwise—in locations and moments of collective work that address a wider arrangement of humans and technology. Focusing on craft, we have seen how the alternative metaphor of co-productions may animate new possibilities for design like considering environments as makers, collective (human and non-human) experiences, ephemeral forms, and resituated histories. … What is being "tinkered" within these alternative formulations is not just stuff, but also selves, relationships, collectives and cultures. (Devendorf & Rosner, 2017: 998).*

Such work seeks to change the margins of design and to tangle with productive dissonance and challenging norms in design (see also the final chapter in Volume 1 entitled Otherwising Design Futures Learning).

Metaphors are also central to the design of hybrid materialities and forms of digital artifacts and the remediation of conventions and exploration of affordances (Jung et al., 2017). They claim that:

> *…forms and meanings of artifacts are connected across various material domains and that metaphors implicitly or explicitly play a key role in bringing a new design perspective from one domain to another, sometimes reified as design conventions. Our investigation extends the perspective on affordances from perceivable action possibilities to invitations for interpreting forms and meanings of an interactive artifact. We also highlight the role of metaphors as a systematic strategy for exploring materialities and affordances of digital media. (Jung et al., 2017: 43).*

Recently, co-published metaphor-related interdisciplinary works have appeared in HCI and Design conferences. Logler et al. (2018) address ways of making and using a generative metaphorical design toolkit and applying it in a case study in using linguistic metaphor in early stage design pictorial work. Central is a four-step design process: (Logler et al., 2018: 1376) as follows: 1) familiarise (capturing rich experience), 2) metaphorize (composing a set of generative metaphors), 3) concretise (making metaphor cards) and 4) explore (bringing metaphor cards into design research). Design Metaphor Cards are characterised as creating 'shared understanding of the metaphor's vehicle, make connections between the vehicle and tenor explicit, legitimise the metaphor within a specific domain, and offer bridging concepts to support initial explorations with the metaphor.' (Logler et al., 2018: 1384). Further, metaphor cards can develop a joint language and help direct topics and agendas. Projected is possible use in policy settings, and transportation, with attention to concepts such as choice, service and payability [→ SEE FEATURE 4].

With similar pragmatic interest, in 'A workshop method for generating ideas and reframing problems in design and beyond', Lockton et al. (2019) were keen to work with participants creating and finding patterns where metaphors 'can be a map to a territory, but should not be mistaken for the territory' and can be put to use in disruptive improvisation (Lockton et al., 2019: 322). Their interest is in ways generating new metaphors 'could inspire creative approaches to designing novel interfaces, products, services, communication campaigns, ways of explaining ideas, and more widely, reframing of societal issues around technology and other issues of global importance, providing an expanded "conceptual vocabulary"…' (Lockton et al., 2019: 322).

Together they see such methods as adding to the designers 'toolbox'. However, they note that this is no simple feat as metaphorical design is still sparse, highlighting that of Logler et al. (2019) mentioned above. Their own methods in New Metaphors cards, under Creative Commons licence, offer rapid associative play for stakeholders and specific interests by way of text and image cards. Such metaphorical methods and devices are also seen to open out ways to reframe critical, pressing issues and stakeholder participation in shaping further mental models, futures thinking and transitions in change, extending to designerly processes (Lockton et al., 2019: 329).

Elsewhere in design inquiry, Dudani and Lockton (2021) also address matters of metaphors in system-oriented design. Recent technology located views on metaphor have extended to human-robot interaction (Alves-Oliveira & Luptenti, 2021) and to metaphors in ways designers may work with Artificial Intelligence (AI) (Murray-Rust et al., 2022). Metaphors are central to communication of complex systems and mediation and projection of their techno-futures.

'Metaphors we anticipate by'

Work on metaphor and HCI is typically futures-oriented. However, it differs slightly from that with a more futures and foresight perspective. This we take up below. However, we do so under the notion of 'metaphors we anticipate by' to accentuated our own anticipatory design perspective in FUEL4DESIGN that distinguishes design futuring making with analysis from more social science foresight research on futures.

The latter does include important work on metaphor, principally that of Inayatullah (1998), and his Causal Layered Analysis (CLA) approach that entails myths and metaphors amongst its 'six pillars' of working with futures. These include: mapping, anticipating, timing, deepening, creating and transforming the future (Inayatullah, 2015) and also extends no non-western contexts.

In Inayatullah et al. (2016: 111), Izgarjan reminds us that metaphors all too often communicate dominant narratives and that attention to metaphor in CLA is about developing critical readings around structures and tropes, such as on feminist positions, cultural and geopolitical colonisation. The aim of CLA (Inayatullah, 1998) is to work to provide alternate futures and scenarios in which metaphors shape and even disrupt strategic organisational change and support ecological framings and pathways (Inayatullah, et al. 2016: 110-111).

Making meaning with metaphor, words and in/tangible tools

BY Palak Dudani

ACTIVITY: BALLUSION and PhD workshop F2F mode

BLOGPOST: 16.11.2020. DESIGN FUTURES LEXICON.

AVAILABLE: Link ↗

Shaping malleable futures

BALLUSION looks at the role of words, language and metaphor in design projects and its relation to futures. As we note in our Unit on this in the LEXICON:

When we talk about the future, we refer to something that lies ahead of us in time. As designers, we're invested in affecting, changing and shaping this 'future'. However, the 'future' is an ambiguous and intangible concept. Using a metaphor to describe the future allows us to make it tangible, making it interesting for us to experiment and play with it.

The BALLUSION workshop explores 'balloons' as a metaphor for shapeable futures. We take this up in the supporting Unit by asking: 'If the balloon represents the future, how might we shape, twist, deflate, go, squeeze, bounce, tap, stretch or release it?'

By treating words as design material, participants cut them out into small strips. These are inserted into balloons and blown up, thereby sending the words into future. The words are brought back to present by popping the balloon and using the fallen words as inspiration to reflect on their design projects.

Identifying Needs and Interests, PhD Workshop #1. BALLUSION, AHO, 28 February 2020

Teachers and facilitators: Andrew Morrison & Palak Dudani

The workshop was designed with PhD students in mind. The aim of the workshop was to explore the use of words in shaping concepts in a PhD thesis, clarify the project's focus in the early phase and position it in relation to the future.

This workshop was initially designed as a face-to-face event and was conducted during early March, before the lockdown period. As the lockdown period went into extension, our project team negotiated this to create a digital version for this workshop.
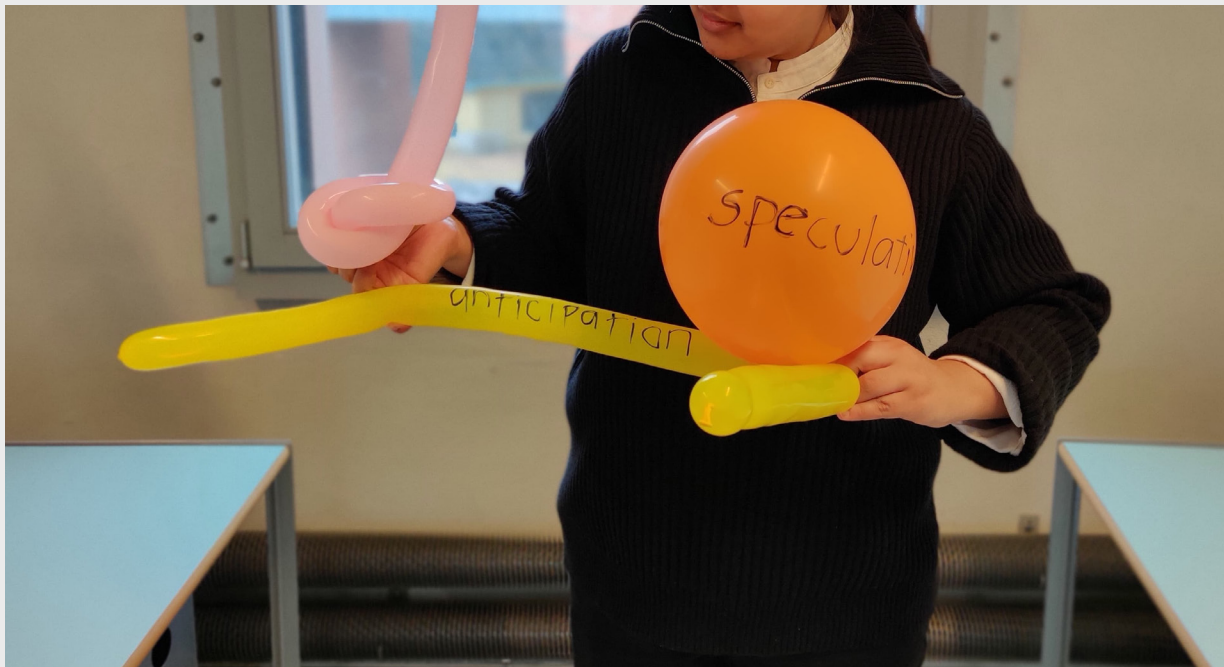
The version shown here gives insights into how we did this learning process together. The revised revision is shown in the UNIT 4.2 LANGUAGE AND METAPHOR.

In this post we share how we conducted the workshop and its key activities and we also share the resources, we used along the way.

▲ Figure 1: Balloons as metaphor for futures, twisted and made into different forms, suggesting the malleability and precariousness of futures. (Above; photo: Yue Zou).

▲ Figure 2: Preparing the in-person workshop at AHO. (Below; photo: Palak Dudani).

Starting with terms from the LEXICON

The PhD students looked at 250 FUTURES DESIGN WORDS and TABLE OF SEMANTIC CATEGORIES as a way to find futures words that relate to their project.

They select a word and write them onto the balloon. They play with the balloons, shaping them into forms that reflect the character of their projects.

Playing with the 'futures' as balloons

In the following phase of the workshop, the metaphor of 'balloon' is used as a way to articulate the futures positioning or what kind of futures the PhD students are working towards.

Students received balloons filled with words. As they popped the balloons, the words fell onto the table, brought into the present.

What does it mean to bring words from the future and about the future, into the present? Discussion followed.

◄ Figure 3: One of the student participants going through a list of 250 FUTURES DESIGN WORDS. (Photo: Palak Dudani).

▲ Figure 4: Student participants selecting words relevant to their PhD project and writing them on their balloons. (Top; photo: Palak Dudani).

▲ Figures 5 & 6: Student participants playing with balloons, shaping them in ways to reflect their projects. (Below; photos: Palak Dudani).

5. REFLECTING ON LANGUAGE AND METAPHOR

ACTIVITY #7: BACK FROM THE FUTURE

The balloon is the metaphor for the future, and contained within it are words. The words inside the balloon represent words in the future. To be able to see/touch/have them you need to bring them down to the present.

1. Pop the future/balloon so the words (or materials you'll use to articulate/shape your design) 'fall' to the present.

2. Which of these 5 words would you bring back from the future?

3. Relate them back to your project/course/discipline. How do these words work to prompt, project or even propel your project into the future?

Next, the participants chose their own 10 words relevant to their PhD project. They cut them into strips and inserted them into balloons. Once inserted, these represented words in the future. In order for them to be seen and touched or accessed, these words needed to be brought down to the present. The students popped the future/balloon so the words would 'fall' to the present. These words are the material students could then use to articulate and shape their project. Popping or releasing or taking away the balloons was like sending them into the future.

▲ Figure 7: The workshop is divided into sections and activities, as shown here in a screenshot of the UNIT 4.2 LANGUAGE AND METAPHOR on the FUEL4DESIGN website.

▲ Figures 8 & 9: Images showing student participants cut the words relevant for their project. (Photos. Palak Dudani (left) and Claire Dennigton (right).

Reflecting on language and metaphor

Quiet individual writing was part of finishing the workshop. The students selected five words from the fallen words and reflected on their definitions in relation to their project. A few more balloons were also popped.

▲ Figures 10 & 11. The cut-out words were inserted into balloons and 'sent into future' (above left). Popping the balloons, made the words within the balloons 'fall back into present' (above right). (Photos: Palak Dudani).

▲ Figure 12: PhD student writing definitions for her chosen words, reflecting on how they relate with her PhD thesis project. (Below). (Photo: Palak Dudani).

'In working with metaphor, lexis and context, the physical workshop version embodied the essence of bringing something into existence, from of our heads and orientations out into the world, from my understanding of the Sanskkrit 'patati'. I'm reminded too of the Hinthi word 'to study' or 'pardina', with the root in the term 'part' meaning to fall from nothing to something. For me this was clearly output shaping anticipatory learning relations words and concepts have disciplinary location, definitions and are realised through contextual meaning'. (Palak Dudani).

HI, I'M OCTOPA. PLEASED TO MEET YOU.

I'm a shape-shifting, fictive, online creature. I spend most of my time trying to make sense of climate change and our complex, dynamic world. The icy waters and slippery surfaces of the Arctic are my home.

I belong and I diverge, I contribute and I evade. I'm a sentient non-human anomaly. I move between sea and land. I'm my physical, biological self, by birth. But I've been altered, by irruption and interruption, against my will, contaminated by plastics and bio-effluent; though that means I'm able to run on land as well.

I am of the past but I move in the present and shift and change in the future. Being a shape-shifter and a time-traveller is what makes me special. Ready for some unexpected moves and some time bending?

THE NORTHERN SEA ROUTE

Oh, did I forget to tell you we'll be connected to the Northern Sea Route (NSR) along the Norwegian and Russian coast? What a massive zone it is and hard to reach and fathom. It's experiencing rapid change from a once frozen passage to one now increasingly freer of ice.

This route is still remote as it was for 17th-century western explorers sailing wooden craft in search of a trade route through the 'North-East Passage'. Today, the NSR is an immense and intricate tangle of interests and potentials: environmental and geo-political, cultural and communicational, political economies with technological innovation.

◄ **Figures 5 & 6:** Screenshots from **octopa.org** that link applied literacies experimentation in design with artistic research.

The view is that changing the metaphor can help new pathways emerge. However, we need to heed warnings, such as Difva and Ahlqvist (2015) announce, that foresight work may contain metaphors of power struggle that may be infused with who is steering its direction. In contrast, looking to six metaphors in developing a service model for systems-oriented foresight (the oracle, machine, garden, open space, power struggle and labyrinth), Dufva and Ahlqvist (2015: 7) argue that:

> … the metaphor of labyrinth highlights unintentional power structures. Often there is a tendency to build new structures, new committees without dismantling old ones. This can lead to a maze of structures, where there are several groups doing foresight, relatively isolated from each other. Futures knowledge and capability is not shared leading to a lot of overlapping work. The metaphor of labyrinth also reminds that foresight is part of other activities, not a separate task for a separate committee.

Such shared knowledge building on futures through metaphor is presented in terms of sense making, strategic intelligence and dynamic capability building. We would add that such views can be positioned more fully as a mode of supporting active, critical and creative design futures literacies.

Metaphors can be culturally specific yet they can also be about universal human mental modelling. Equally, they are semiotically important in futures inquiry. Tarasti (2016) discusses metaphors in relation to specifically existential semiotics and three kinds of transcendence (empirical, existential and radical) with the latter two opening up anticipatory potentials. Here, metaphors concern time and scenarios especially.

In working with old and new metaphors Kuusia et al. (2016: 126) focus on metaphors and the concept of litany. They demarcate litany as 'a written, spoken or pictorial text that anticipates the future or suggests future relevant action(s)' and study assumptions and anticipation behind them, concerning systemic causes and world views, and in long-standing and internet located metaphors leading to application in futures and language constitutive scenarios.

Metaphors are seen, following Inyatullah (2004), as concerned with deep stories and archetypes where language works evocatively and emotionally through visual images (Kuusia et al., 2016: 128). This is illustrated via analysis of a text from the Voice of Russia on the Northern Sea Route from 2014, described for example in metaphors such as an artery and the melting of sea ice allowing navigation as a 'gift' to the Russian people. (Kuusia et al., 2016: 129; see also final chapter in Volume 1: Othwerising Design Futures Learning and the 'Octopaltas': Link ↗).

Concerning the projection of future navigability due to climate change and stately stewardship of an emerging 'avenue', trust is discussed more fully in terms of it being earned and as risk taking, and its situational and cultural framings. On this score, Trarasti (2016: 16) argues that avoidance of cross-cultural misunderstanding may be achieved through attention to existential semiotics and inferential and exploratory futures-oriented inquiry in which metaphor features. Inyatullah et al. (2016: 114) state that 'metaphors play a key role in framing issues and thus in defining how we decide to act and play our roles in creating the future'. Further, Inayatullah (2015: loc 4973) concludes that '... over time we have found that all levels are important, working at the metaphorical – the narrative level can lead to the most profound change.'

This is mentioned in regard to replacing the notion of 'used futures', being ones that we need to divest ourselves from by means of creative, transformative activities by using new stories and metaphors to materialise shifts in world view and systemic change. Here metaphor conveys cultural codes and works through worlding activities, including role play (Inayatullah, 2015: 5052). It may be used to offer alternate narratives to the commercially constructed techno-futures from 'Silicon Valley' by offering alternate futures.

In terms of design, futures and the 'crisis' of migration into affluent nations, work has been taken up with a diversity of stakeholders such as government departments and university staff, such as on restrictive 'nation as body' metaphor used to 'naturalise' challenges to asylum seekers and policies in Australia in terms of 'contamination' and 'drowning' metaphors and alternative more positive discourses, practices and experiences (Bin Larif, 2015).

In our own work on metaphor, persona and counterfactuals, critical speculative design narrative is elaborated in the final chapter. Our focus is on the Northern Sea Route and a more fully developed version of personas, canvases, participative scenario experiences and strategic follow-up work to shape critical situational literacies around geopolitics, power and climate change [Figures 5 & 6]

Recently, Fisher and Marquardt (2022) have explored links between critical Futures Studies and experiential futures by way of metaphor situated in Systemic Metaphor Analysis (SMA) using a sci-fi role play game to escape probabilistic thinking and reconstruct metaphors of AI. As a methodological entry point and a means to exploring technological pathways, SMA is elaborated as working with a pluralising hermeneutic rather than single one. Attention is given to the synthetic, abductive and self-reflexive in context (Fisher & Marquardt, 2022: 64-65).

'Metaphors we learn by'

Parents and children, teachers and students all use metaphors in daily communication and processes of learning and teaching (Badley & Van Brummelen, 2012). Metaphors are used to help build mental models of our immediate settings and experiences as well as to help us fathom our ones beyond our grasp, in the zone of the not-yet, the ephemeral and the indistinctly alluring, troubling and emergent.

Metaphors function verbally but also multi-modally and are a central part of helping meaning making that also concerns futures and anticipatory thinking. Ortony (1975: 53) writes that:

> *The great pedagogic value of figurative uses of language is to be found in the potential to transfer learning and understanding from what is known to what is less well known to do so in a very vivid manner. To appreciate this fact maybe to make better use of them to better understand them. Metaphors are necessary as a communicative device because they allow the transfer of coherent chunks of characteristics – perceptual, cognitive, emotional and experiential – from the vehicle which is known to a topic which is less so. In so doing they circumvent the problem of specifying one by one usually often and nameable and innumerable characteristics; they avoid discretizing the perceived continuity of experience and are thus closer to experience and consequently more vivid and memorable.*

For design futures literacies, there is great potential to further explore 'metaphors we learn and teach by' (e.g. Hard et al., 2021). Our shared task could be to explore their structural and poetic character in a design futures view and ways they may be analysed further as to what they might contribute to anticipatory design pedagogies across a diversity of tools, techniques and methods [Figure 7], as taken up by Diez, et al. (2020).

4.
Play and cards in design futures literacies

BY Andrew Morrison, Palak Dudani, Corbin Raymond & Vlad Lyakhov

Play and design for learning in serious times

In this section we turn our attention to play and card games in shaping design futures literacies in uncertain contexts of change. Including play in design futures literacies points to ways in which curiosity and engagement may be motivated and enacted and connected with hope and potential options and unfolding. In our wider project view, design futuring and its imaginative, exploratory character needs to build on activities that allow ludic, quirky and unexpected ways to investigate and embody the unseen, uncertain, unfamiliar and unknown.

This section focuses on cards, not online or desktop computer games [→ SEE **FEATURE 5**]. . Play, games and game play have become a key part of contemporary consumer leisure experience and popular culture. Location-based games and massive online formats and processes have expanded in one of the largest components of global digital and distributed, participative commercial media. More recently this has been conveyed through simulated and augmented and mixed reality modes of engagement and embodiment, connected to social media. Dynamic media and experiential immersion are central to the pervasiveness of the lifeworlds being both co-created and marketed.

Card games, widely used in design and increasingly in design futures work, seeks to shift engagement into modes of 'gameplay' so as to allow possibilities and reconfigurations to appear and be taken up, as fresh and as risky materialisations of sources and resources that might be re-positioned in plural futures views. This contrasts to the drives for control and demarcated decision in strategic futures decision-making. For designers, there is a need to open out fuzzier and emergent spaces so as to be able to explore their diverse nature and options, expose their characteristics and make trouble with their assumptions. Foresight goes from planning and needing to know, design fiction, anticipatory articulations are about radical and even ludic imaginings.

FUEL4DESIGN has explored playful futures design pedagogies in all its work packages in shaping anticipatory design literacies. This we have dome despite a global pandemic, for example in a PhD speculative design and climate change project on 'smelling the future' (e.g. Zou & Morison, 2022) In the DESIGN FUTURES LEXICON, for example, the paper and digital versions of BALLUSION invite different ways of learning playfully about more serious design projects and contexts. The FUTURES PHILOSOPHICAL PILLS constantly ask students to hold and make sense of decks and 'suites' of positions in orienting themselves in clarifying their interests and directions. Our tools and their uses have sought to engage

learners in energies of play and playful processes of learning about serious matters, including their own meta-literacies whether conceptual or linguistics, philosophical or methodological.

We have also worked with pastiche and irony in speculative design futures doctoral research and the building of related futures literacies resources with allied projects such as Amphibious Trilogies between art, design and social science. The interface and content of this project website draw on inputs from the LEXICON on movement words and kinetic discourse relations, and is an instance of how dynamic interfaces may engage us not just clicking on a blog post, but in our actions seeking how a communicative, informational and multimodal polyverse moves differently each time, meandering and moving, drifting and swirling in a sea of relations, less solemn more playful, always offering different pathways and future readings.

Extending to personas, we have been keen - through contributions from the LEXICON and influenced by the need to better position our pedagogies in being inspired by the PILLS – to include queer identities and characterisation as means to developing engagement in working with systemic and geopolitical issues. Here subversive tones and playful posturing invite identification and affinity as well as announcing deviance and dissembling. Students and teachers in an OCTOPA workshop also used Spatial Chat as a platform that allowed movement and self-assembly as part of travelling a digital and ludic interface where counterfactuals abound in a non-mimetic map of the contests over the northwest European Arctic.

While 'edugaming', and the gamification of education are taken up critically and performatively, in design education, research and professional practice, design cards, typically in print and face-to-face-mode, remain central parts of engaging participation. In the context of discussing the 'gaming of futures literacy', Candy (2018: 234) observes that '… just as games are venturing into serious territory, the at times overwhelmingly serious practice of futures has been learning to be more playful.'

At the same time, however, the global climate crisis and related environmental, socio-economic and political concerns, place of design classrooms in a gloomier pall. What then might design cards be taken up to do in contributing to and changing our design futures literacies and pedagogies? How might we work with them to question and even disrupt given expectations and practices? Might they instigate a sense of curious designerly critical play into the anticipatory dynamics of learning together? What might we be able to put into play as it was through working with design cards in a futures literacies by design mode?

These were some of the questions asked in the project and that we to a large extent addressed in three different work packages. In this section we seek to connect them a little more descriptively and analytically. First, we position what and how design card games appear, are used and imply. We then look specifically at one strong futures card game before presenting and discussing our three initiatives to include design cards in our own emergent futures pedagogies. They were a parallel part of a wider suite of tools and means to exploring how to support and facilitate design futures literacies in

On card-based design tools

BY Andrew Morrison
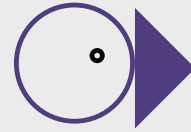
Background

Deployed as far back as the 1950s, design cards have been widely taken up ones such the as the Oblique Strategies original pack (**Link** ↗) designed in the mid-1970s by the musician Brian Eno in 1975. Design cards have had been pervasive in design classrooms and projects and they have been widely marketed and taken up in design consultancies and strategic design business activities.

Such card have been characterised as catalysts for opening out imagination and for supporting acts of design envisioning (Friedman & Hendry, 2012). This is patently so in the instance of IDEO's Methods Cards (**Link** ↗) that are only available from a book store in San Francisco in the USA. This set of 51 cards were developed via a diversity of educators and students, businesses and designers. They are offered as a set of inspirational design tools that present methods to 'keep people at the centre of our design processes' (**Link** ↗).

Cards are widely used and discussed in design education, with limited discussion and analysis of their strengths and weaknesses. In design education, practice and research, cards first took physical form, and have been both commercially produced, and are now widely taken up and in digital and physical forms, for collaborative activity (Lucero, et al., 2016) and in terms of positioning.

Five main categories

Wölfel and Merritt (2013) sketch out a design space for design methods cards through providing a survey of 18 well-known card tools at the time. They arrange these and their differences according to five main categories: Intended Purpose & Scope (general, participatory, context/agenda), 2) Duration of use and placement in design process (anywhere/anytime, beginning of a process, specific point), 3) System or Methodology of use (no methodology, suggestion for use and specific instructions), 4) Customisation (none, trivial, optional, required) and 5) Formal Qualities (only text/only image, text and images, structural categories, virtual component). These categories remain applicable in the development and analysis of design futures cards geared towards supporting design futures literacies. Wölfel and Merritt (2013) found that few cards allowed for customisation, with room for digital augmentation and space for exploring further connecting physical and digital tool relations and elements.

Recent reviews

However, more recently in a review and analysis of 155 card decks, Roy and Warren (2019: 149) note that 'The largest proportion of decks aimed to facilitate creative problem solving (25.8%), followed by tools for domain-specific designing (25.2%) and for human-centred design (23.9%). There were a smaller proportion of decks to aid systematic design processes (11.6%), team working (9.0%) and futures thinking (4.5%) ...'. Further they observe that many of these decks have been taken up and used by the parties that design them and that there is room for more independent analysis. In summary, they found that design cards were meant to do different work '... from providing creative thinking prompts and digests of good practice or design methods, to offering checklists of issues to be addressed and concepts and solutions for specific design problems.' (Roy & Warren, 2019: 150).

Aart et al. (2020) conducted a two-part study (a systematic literature review and card sorting interviews with design students) that led to criteria for a framework of card sets. For Aart et al. (2020: 425) in design, essential are not only the card content but processes of use of the cards. They see that we need to understand cards as a communicative medium, 'Designers naturally sort and group cards due to their tangible nature, making them a very different medium than other media that are used to spread design knowledge.' Design cards are patently tangible tools on their physical form; however, as we cover below they may also be put into play as digital and generative tools through which futures may be prompted and projected as part of our changing design futures pedagogies.

Extending contexts of use

In recent years the burgeoning use of cards in designing and design research has spanned the creation of game design processes through the use of design-driven exertion cards in the context of HCI and embodiment (Mueller et al. 2014) to ideation cards for mixed reality game design (Wetzel et al., 2017). With such focus on interaction design, attention has also turned to the design and uses of cards in supporting designers in working in a sharing economy frame (Fedosov, 2019; Fedosov, 2022). Perhaps unsurprisingly, attention has also been shifted to the uses of cards in contexts for care and community, with focus on alternative care paradigms (Martino, 2021) and in contexts of engaging in design and matters of sustainability (see Ræbild & Hasling, 2017).

Design cards engage us in symbolic, mediated acts of playful meaning making, guided by their rules and their socio-material referents and the performative and experiential activities of gameplay. Casais et al. (2019 remind us that they can be put into play to promote and support value in use through design where happiness is the key goal. Equally, different, preferable and possible, better futures also might be the point to reach towards in card dynamics that may be activated to facilitate engagement and hope as opposed to modes competition and conquest that typify them.

diverse contexts but also more generally in the light of needs to work towards shaping long-term sustainability where engagement and serious play (Flanagan, 2009) in our view need to be connected.

On cards, design and 'gameplay'

Card-based design tools have been widely taken up in design, design education and research, often in physical form and through known genres of decks and stacks along with rules and roles in directed activities of dynamic gameplay, in analogue and digital forms (e.g. Peters, et al., 2020). Accordingly, their intentions, game logics and uses have varied due to their motivations, aesthetic and experiential structuring and their enactable and performtively embodied materialisation of world views and modes of directing preferences and opening out options [→ SEE **FEATURE 5**].

Card-based design tools have also been influenced by ways they work to support and facilitate processes and activities of worlding, and this has in part extended to future shaping. Key advantages of cards as design tools have been summarised by Deng et al. (2014. 696) as helping discussions, supporting different views on a design space, speed and refine ideation and iteration, contribute to a shared vocabulary, allow for physical manipulation and reference in discussion as part of wider exchange of design ideas, engagement and communication.

In our experience, design cards, and by extension their futures orientation and specific design for anticipatory learning and participation, offer engagement and action through their knowledge framing activities and related dramaturgical dietetics. However, design cards have not often been analysed in terms of their related design literacies. Indeed, at times they have been criticised for being seen as 'naturally playable' in which their decks, 'suits' and dynamic play are not analysed in terms of the world views their co-constructionist dynamics they enact.

Candy (2028: 242) reminds us that in order to move our foresight and anticipatory thinking onwards more clearly with limits and boundaries that support engagement, one way is 'to invite gameplay with the boundaries and parameters (assumptions, causal chains, narrative premises, themes, etc.) that frame particular conceptions of times to come.' However, discussing cards. Design and Human Computer Interaction (HCI) in particular, Aarts et al. (2020: 419) reflect that '... little information can be found that guides future designers as potential users of such design cards in identifying such cards and selecting the ones that are most fitting for their specific design challenge.'

Gameplaying, futures and design cards

Play is central to design cards. It provides a foundation for their material choices and mediational forms. Ludic logics, performative rules and gameplay structure the dynamics of games (Flanagan, 2009), including that of design cards. However, concerning a wider reaching and longer-term view on foresight, futures and anticipation, there are few examples of design cards that more discursive and critical in character than the majority of more declarative and decision oriented ones.

One exception instance is the *Thing From the Future* (Candy & Watson, 2015). This card game works as a prototypical prompt towards a gaming of futures literacy. It is a key example of how design cards may be oriented towards anticipatory concerns in a mode of imaginary experiential and combinatorial foresight.

Designed for 1-6 players in face-to-face and paper-based mode, 'The object of the game is to use the cards to generate the most interesting, funny or thought-provoking ideas for artifacts from the future. There are over 3.7 million possible prompts in the deck.' On reflecting on the design of the *Thing From the Future*, Candy (2018: 235) reflects that the tool is 'Part scenario generator, part design method, and part party game it invites players to collaborate and compete in describing, telling stories about, and sketching or physically prototyping artefacts that could exist in alternative futures.'

Groups of players themselves create a prompt and need to describe a related artifact from the future thereby revealing more about their perceptive and projected world making and its articulations in and through present-day conceptualisation and uses of products and services. s

Drawing on Dator's four generic futures, four suits are in play: Arc (time), Terrain, (context) Object (thing) and Mood (affect). This was then simplified in a revised version to: Future, Thing and Theme (Candy and Watson, 2017; 2018). These three archetypal like elements can be synthetically related to each other at different levels in a wider 'reverse archaeology' (Candy 2018: 239).

One of the key issues arising through massive use and feedback has been to work further with relating the enjoyable randomness in the performativity of playing the cards and responding to contexts of use and application. Overall, Candy (208: 240) observes that:

> *What The Thing from the Future offers as a futures method might be said to consist in the way its design and storytelling engine operates mostly unseen 'under the hood', with the effect that without great effort, players can engage in a quite sophisticated form of integrative, imaginative thinking, embedding abstract future-narrative notions in particular concepts for future things, all while actually enjoying themselves.*

More than playing the hand you are dealt

For design students design cards with a futures bent offer inbuilt affordances and communicative potential. They relate to canvases and situations of framed use yet remain open to being played. This play, however, when framed in an activity and process-centred approach to anticipatory and relational methods, centred on context, needs, emergence and uncharted outcomes offers spaces for recombinatorial permutations and perhaps unexpected arrivals, in working towards such spaces of anticipation, we invite learners into mixed modes of embodied and affective engagement.

Candy (2018: 239) comments that:

… a game format or framing can be helpful in and of itself for the futurist facilitator seeking to trigger a hypothetical, exploratory mindset, affording players not only permission to think along heterodox lines, but offering the specific materials of imagination with which to do so. The cultural norm associated with card games of literally "playing the hand you are dealt", rather than rejecting the terms of the hypothetical – a common problem when working with future scenarios in more prosaic formats – also may help players grant permission to themselves to range into previously uncharted imaginative territory. (Candy, 2018: 239).

However, in our experience in working more specifically with terms and concepts, world views and framings, scouting techniques and mediated materialisations, this is more than simply a matter of 'all hands-on decks'. Let's go back a minute to the Thing from the Future. Candy (2018: 242) writes that '… what it attempts is to make a kind of generative "source code" for boundary-drawing in futures available to more people' and that prompts '…that confine and challenge the imagination in each round of gameplay present a pathway disclosing potentially brand-new vistas unimaginable until one ventures along it.'

In FUEL4DESIGN we took up design cards actively in the new tools and learning resource development in three of our work packages. These are featured below. It wasn't part of an explicit project plan that we would take up design cards as one of our cross-project tools, yet they featured significantly in three of our work packages. We did so in a mix of the physical, digital, and hybrid in collaborative meaning making (see also Lundqvist et al., 2016). Full print and digital version are available in our project website for open use.

Below, we present the visualisation of design cards from the FUTURE PHILOSOPHICAL PILLS from I02 in use following their redesign in a second generation outcome that was implemented after then main lockdown of the pandemic [→ SEE FEATURE 6]. A blog post from the DESIGN FUTURES LEXICON in I0 provides a designer-teacher's reflections on using the REFLEXICON [→ SEE FEATURE 7]. We also present an account of how cards relating to the 'Atlas of Weak Signals' in I03 were taken up in a diversity of collaborative pedagogies [→ SEE FEATURE 8]; [Figure 8].

Peters et al. (2020: 21-22) summarise possible developments in tool development, including cards, as involving 'attention to value sensitive design, highlighting of cultural-tailoring, greater inclusivity and study of why designers do or do not use tools in practice, further customisation, attention to embodiment and tool efficiency evaluation'. The 'hands of cards' dealt in these FEATURE may be assigned, distributed, chosen and connected differently to what we present here. We have not played these cards together in a joint workshop. Nor have our students tried them all out in one venue and compared their intentions, applicability and suitability to their specific design projects at a wider and holistic scale. These options, amongst others, remain available for development and use beyond our design and direction.

Futures Philosophical Pills: Visualisation of the cards in use

BY Betti Marenko

▲ Figure 1: Browsing the instructions and getting ready to play. The final iteration of the deck ran by Hybrid Futures Lab. The Future Philosophical Pills workshop at Central Saint Martins, UAL, 10 May 2022. (Image Credit: James Bryant).

◄ Figure 2: A journey to create an 'otherwise future' or an alternative present': card decks assembled and ready during the final iteration of the deck ran by Hybrid Futures Lab. The Future Philosophical Pills workshop at Central Saint Martins, UAL, 10 May 2022. (Image Credit: James Bryant).

Start with the Future Philosophical Pills,
Play with the permutations generator:

▲ Figure 3: Working with the Research Prompts to kick-start world-building. During the final iteration of the deck ran by the Hybrid Futures Lab, we finally returned to physical/ in-person mode. The Future Philosophical Pills workshop at Central Saint Martins, UAL, 10 May 2022. (Top; Image Credit: James Bryant).

▲ Figure 4: The cards in digital mode (repurposing software from the LEXICON). (Bottom; Project website).

REFLEXICON and PhD workshop in online mode

BY Palak Dudani

BLOGPOST: 19.11.2020

AVAILABLE: Link ↗

Designing with futures terms

REFLEXICON builds on the Lexicon of the Future Education and Literacy for Designers, and invites designers to play with future terms. It uses game play as a way to support designers on use and application of Futures Design terms and reflect on how their design project or activity work might relate to shaping future needs, conditions and challenges.

As the Unit 7.2 REFLEXICON notes:

With its three game modes, the REFLEXICON invites designers and designer-researchers to understand how the terms from the Design Futures Lexicon already interact with their practice and how they can strengthen their project work through future-proofing.

As the name suggests, playing the REFLEXICON is itself is a reflexive activity: doing so won't produce results and ideas for a project. This is really about thinking in a deeper way about the practice of design or the work currently underway or planned and how to think reflexively about the nature of design research.

The REFLEXICON was initially designed as a card game for individual or group use in a face-to-face event. After the lockdown, the The REFLEXICON was redesigned into an interactive digital game, reusing card game-based codes to help explorations with the content or words of Lexicon in a reflexive way. In order to make it possible to play the game in both physical and digital settings, the REFLEXICON page now contains both a print-ready PDF version of the cards and the digital interactive version for online play.

(ONLINE) REFLEXICON: INTROSPECULATION

SWITCH GAME MODE

A reflexive game encouraging to look at how terms from the Lexicon are interlinked - or disconnected - with your project or activity and how these terms could shape your work or posture as a designer.

Reflect on the question generated and speculate on how it could be different. Iterate by reloading the combination to push the introspection further. **(HIDE THE RULES)**

WHEN
DOES...

+

SCENARIO

• A future situation that could emerge, happen or develop.

• An imagined, designed or projected possible future plan or event.

• An outline, description or mediation of future actions or events.

• A written description of events in a play or film.

+

DIVERT

+

(IN)
THE MATERIALITY OF MY IDEA

In other terms: the way(s) you express and materialise your idea or concept to communicate or demonstrate it.

⟳ **GENERATE A NEW COMBINATION**

I need some help: **SEE THE VIDEO TUTORIAL**   I'm done with the REFLEXICON: **I SHARE MY FEEDBACK!**

▲ Figure 1: A gif of the REFLEXICON digital interactive tool. (Top; Project website).

▲ Figure 2: The card based REFLEXICON game. (Bottom; Photo Bastien Kerspern).

Engaging in Futures Enquiry in Design, PhD Workshop #2. REFLEXICON.

AHO, 13 March 2020. Teachers and facilitators: Andrew Morrison & Palak Dudani

The REFLEXICON workshop was planned as a digital synchronous workshop and conducted over zoom. In order to facilitate the workshop remotely, supporting material such as the digital interactive tool and a video tutorial were designed. The participants also had the option to share their feedback using the feedback form. The workshop was designed with PhD students in mind. The aim of the workshop was to introduce the students to a design game as a way to question how futures design words work.

◄ Figure 3. A screenshot of the Google document used to structure and facilitate the project's first online and completely synchronous workshop.

The game play also encourages students to connect critical reflection and reflexive review as part of their design research practice.

In this post we share how we participants played the REFLEXICON game and their reflections on how it supported them in their design research work.

Within the workshop, the participants are encouraged to have a short write up of their project before they can begin playing the REFLEXICON. The participants start with the video tutorial to understand the rules and instructions. The RELFEXICON has three game modes and participants can attempt them in any order..

Game Mode #1: Introspeculation

The Introspeculation game mode encourages designers to look at how terms from the Lexicon are interlinked – or disconnected – with their project or activity, and how these terms could shape their work or posture as a designer. It prompts players to reflect on the question generated and speculate on how it could be different. Players can iterate by reloading the combination to push the introspection further.

One of the PhD student participants found the combinatorial aspect of the terms interesting saying that 'it sharpened my critique of different words'. Another mentioned that they found this game mode 'highly relevant' for their work, one of them expressing that '[it helped me] create perspectives on my article/ work'.

(ONLINE) REFLEXICON

DESIGNING WITH FUTURE TERMS
REFLEXICON in a game that invites you to play with future terms from the Lexicon of the Future Education and Literacy for Designers project.

The REFLEXICON will help you apply the terms to your design project or activity as a designer to understand how your work might relate to shaping future needs, conditions and challenges.

SELECT A GAME MODE TO START:

INTROSPECULATION

Introspeculation is a reflexive game encouraging to look at how terms from the Lexicon are interlinked - or disconnected - with your project or activity and how these terms could shape your work or posture as a designer.

START!

MORE OR LESS

More or Less is an ideation game helping you in levelling the influence of each term from the Lexicon in your project and envisaging how it can transform your design work.

START!

IN SPACE

In Space is an inquiry game spatialising the Lexicon in the real world. By inviting you to look beyond your project, In Space helps in thinking how these terms might be already linked to our everyday life or could relate to it.

START!

(ONLINE) REFLEXICON: INTROSPECULATION

SWITCH GAME MODE

A reflexive game encouraging to look at how terms from the Lexicon are interlinked - or disconnected - with your project or activity and how these terms could shape your work or posture as a designer.

Reflect on the question generated and speculate on how it could be different. Iterate by reloading the combination to push the introspection further. **(HIDE THE RULES)**

WHEN DOES...

+

SCENARIO

• A future situation that could emerge, happen or develop.

• An imagined, designed or projected possible future plan or event.

• An outline, description or mediation of future actions or events.

• A written description of events in a play or film.

+

DIVERT

+

(IN)
THE MATERIALITY OF MY IDEA

In other terms: the way(s) you express and materialise your idea or concept to communicate or demonstrate it.

↻ **GENERATE A NEW COMBINATION**

I need some help: **SEE THE VIDEO TUTORIAL**   I'm done with the REFLEXICON: **I SHARE MY FEEDBACK!**

▲ Figure 4: Screenshot of the REFLEXICON digital interactive tool (top).

▲ Figure 5: Screenshot of the game mode Introspeculation of REFLEXICON digital interactive tool (bottom).

(SHOW ME THE RULES)

LESS OF

+

PROJECTION

The sending or moving something forward, an idea or a voice, an estimate of a future plan, situation or event based on what is already known, and a psychological act that places attention on one's own views, desires or fears onto another.

+

(IN)
MY CONCEPTS OR IDEAS

In other terms: the raw ideas as well as the refined concepts you came up when designing.

⟳ GENERATE A NEW COMBINATION

(ONLINE) **REFLEXICON:** IN SPACE

SWITCH GAME MODE

(SHOW ME THE RULES)

ANTICIPATION

To take care ahead of time, to look forward to or to visualise a future event or state, to be apprehensive or excited something will perhaps happen 'tomorrow', to have an expectation, hope, preparation or knowledge concerning a future scenario.

+

IN 50 YEARS

IN 5 YEARS

TOMORROW

(IN FRONT OF YOU)

⟳ GENERATE A NEW COMBINATION

Game Mode #2: More or Less

More or Less is an ideation game mode, helping designers in levelling the influence of each term from the Lexicon in their project and envisaging how it can transform their design work.

It prompts players to imagine what more or less of this term might change for their practice or their work.

While playing this game mode, PhD students reflected: "when we say more 'speculative' does that mean being less critical?" They felt that it was "helpful for me to think about my research in a different way and I can see different things I cannot see before the workshop.

Game Mode #3: In Space

The In Space game mode is an inquiry game spatialising the LEXICON in the real world. By inviting designers to look beyond their project, In Space helps in thinking how these terms might be already linked to our everyday life or could relate to it. The instructions say:

Look at what the arrow card is pointing to. Consider the whole environment or a specific element being pointed. Reflect on how the term could be linked to what the arrow is pointing to and might evolve tomorrow, in time.

▲ Figure 6: Screenshot of the game mode 'More or Less' of REFLEXICON digital interactive tool (top).

▲ Figure 7: Screenshot of the game mode 'in Space of REFLEXICON digital interactive tool (bottom).

▶ Figure 8: A PhD student participant sharing their notes on how they used the physical card game in a digital remote workshop setting. (Photo: Yue Zou).
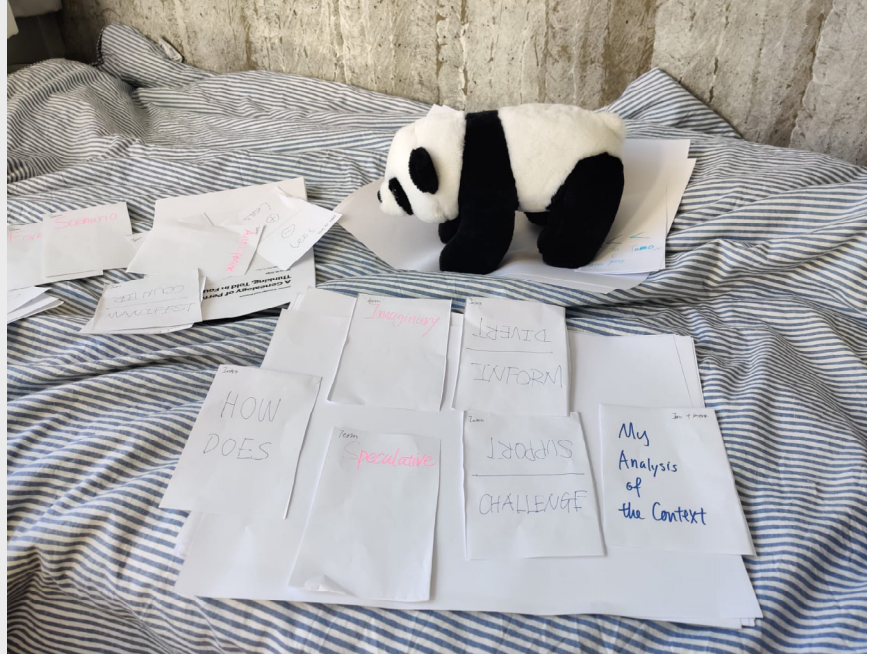
During feedback discussions, one of the PhD student participants felt that 'space game [mode] is very helpful for creating scenarios' while another said that 'it builds a connection with reality'. A PhD student who's looking at the role culture within service design reflected how 'the mode helped me to think more about the change and development of a specific term, which can push me to imagine the relationship between a term's present and the future.'

Discussion and reflections

The PhD participants described playing the REFLEXICON as 'doodling with words, like a creative method for understanding and issue-making', and as a 'a way to expand my thought and encourage me to think about the details of my research'.

What words do the most work for us? When we define words for ourselves, they're tied to the core concepts we're going to use. At that time, we have to strike a balance such that the words are general enough to be understood but specific enough for our work (within the discipline we are). The PhD students reflected on the use of words, and how 'words hold different meanings in different disciplines. When working with

words, there are questions one has to ask oneself.

The game is set up in a good way to support that.' Another mentioned the role of words in supporting 'imagination' and 'if you have a word for it, you can think about it'. Going deeper in the use of specific words, one of the participants chose 'inter-factual' and said 'it sharpened my argument on what role it plays in the process as designer.'

Another participant chose 'reflexivity' saying how it helps them question the role of 'reflexivity (and how it) informs the process of my research, it's significance in my research. What am I doing differently from others and why is it important? We used the terms 'less' and 'more', it's a dualistic idea but in my project I have multiple views.'

Prof Amanda Steggell, a choreographer from Oslo National Academy of the Arts attended the REFLEXICON workshop and noted:

… the instructions of the game appear to be more fluid. For example, the terms, as described, challenge participants/ users to find/discover/discuss other descriptions of the terms, more situated in their specific projects, more than less, suited and situated in the world. And not in the least, the lexicon and game can be.

DESIGN FUTURES SCOUTING: Cards in the Atlas of Weak Signals

BY Oscar Tomico & Mariana Quintero

Introduction

Design cards formed part of our design educational work in developing and testing applications of the Atlas of Weak Signals. Here, weak signals refer to early indicators of change that might have the potential to trigger major events in the future, which turn them into a key concept to include in the process of framing future-oriented design interventions. Overall, 'The Atlas is a tool for combatting future challenges by actively creating opportunities for design interventions to dissolve the troubling problems of our times'. (Diez et al., 2020: 1).

Context

The Atlas of Weak Signals is a toolkit that was developed by Fab Lab Barcelona in the framework of its Masters in Design for Emergent Futures programme, but that has found applications in a wide range of spaces and users. It consists of four decks of cards and a Design Space canvas. The main deck consists of 25 weak signals divided into 5 thematic groups representing areas of interest, concepts and realities that are offering major space for transformation in all areas of society ranging from technology, media, culture, production and consumption, to identity, politics and climate emergencies. These were curated by renowned cultural analyst and researcher Jose Luis de Vicente in collaboration with Fab Lab Barcelona as an effort to offer a navigation tool for design researchers and students looking for intervention opportunities in an oftentimes overwhelming landscape of huge systemic shift. (Diez et al., 2020: 1).

Design and making

In the beginning, the Atlas was presented in a classical seminar format in which master students would get an overview of the 25 selected signals, their realities, key statistics, reference projects and opportunities, but later it was noted that a methodological shift was needed in order for participants to be able to bridge and

▲ ▶ Figures 1-4: Fab Lab Barcelona activities at Workshop at Space10, Copenhagen, 26.02.2020. (Above and following page; Image credit: Fab Lab Barcelona).

Fab Lab Barcelona visited SPACE10 in Copenhagen to present the Atlas of the Weak Signals practice, hosting a series of inspiring talks on emergent futures and a workshop on the Weak Signals card game which was developed by the team at Fab Lab Barcelona. This was a half-day program in which 60 participants – employees from SPACE10 amongst other attendees -were introduced to the Atlas of Weak Signals.

apply this reference system into their practice as design researchers. That is when the cards were created. To the main 25 weak signals system, other four decks of cards were added, so that a combinatorial strategy could offer personalisation and triangulation opportunities in between the signals themselves but also connecting them to infrastructure, design challenges and further triggers to expand on the topics presented. A Design Space was included as a canvas with guided instructions, so that the methodology could be activated autonomously or with the aid of facilitators that needn't be experts on the theoretical aspects of the topics. In the end, the configuration of the toolkit turned out as follows:

Deck 1: 25 Weak Signals of Emergent Futures organised in 5 groups: Design for the Anthropocene, Life After AI- The End of Work, Life in the Times of Surveillance Capitalism, After the Nation State and Kill the Heteropatriarchy

Deck 2: Areas of Opportunities - Strategic areas of research that have been identified by Fab Lab Barcelona as major areas of innovation (Diez et al., 2020: 1)

Deck 3: Random Triggers - A collection of sub-topics and further weak signals that aid with the unpacking of the cards in Deck 1. These offer keywords and vocabulary for further exploration

Deck 4: Challenges - Five cards that describe specific challenges for innovation: Institution, Service, Professional Role, Policy, and Product.

Use and applicability

The cards were created as a support system to bring the complex intellectual output of the Atlas seminar to the Design Studio, but their use turned out to be so intuitive and flexible that soon we noted that they could be taken out of the limits of the educational programme to be offered as an ideation or research tool for independent practitioners, organisations and companies interested in future-scenario making and forecasting.

As an in-depth resource for design education practice, we were able to test

inside the framework of the Fuel4Design programme, how the Atlas toolkit could provide structure within our Design Studio methodology to bridge the gap between ideation and envisioning, to actually framing and deploying design interventions in context that transformed communities and local socio-technical systems.

We were able to extend the card system with multi-scalar mapping canvases and activations that launched the exploration and deployment of how to bring those global weak signals into actual contexts of transformation. The cards proved to be an organisational reference system where the students could visualise their research, find keywords and new vocabulary for latent interests they had, and share with tutors and possible partners as a visual communication tool.

Students come to the Masters in Design for Emergent Futures programme from various backgrounds ranging from political science to ecology, with the intention to contribute positively to our current systemic crisis predicament via design. The challenge on how to start such a process when a student or a participant hasn't designed for that particular area or hasn't even participated in a design process before is where the Atlas comes in. It helps situate students, it offers a starter design space to gain confidence and direction on where to begin the process.

Finding Weak Signals to Design Emergent Futures. 26.02.2020

This alternative educational experience provided an opportunity to question, disrupt and challenge methods of practice, offering a chance to learn alternative perspectives on contemporary issues.

5.
Design, futures and mediational means
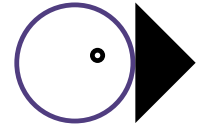
Introduction

BY Andrew Morrison

FUEL4DESIGN has taken up a diversity of platforms, tools, media and modes of mediating its developmental and exploratory design pedagogies. In design schools, students use a multitude of software and convey their projects through multimodal mixes and formats, with materials increasingly being recombined and articulation of designs percolating into and influenced by adjacent design domains as well as through novel links between and across them. Design educators support students to work with designing - whether in briefs or self-directed semesters or master projects or PhD chapters or journal articles – in which their physical and digital literacies are exercised in dynamic relation to one another and configured to meet their points of focus, need and mediation.

In all of these endeavours, designs are mediated, that is they are shaped individually and collaboratively and articulated via paper and screens, in 3d physical and digital forms, and communicated via projections in place or by ways of screen shared digital platforms. Design futures literacies are deeply implicated in how commercial tools and platforms are employed and how we consider the affordances and preferences, along with the practices they instil in our contexts of use and circulation. In this book we have included a range of representation forms and mediated examples of how tools and platforms, modes of communication and different media have been taken up in the life of the project and a pandemic that forced us to make a digital pivot and to reassess our ways of working and learning together. In this section, we shift focus to two cases, different in nature and orientation, developed in the project where mediational aspects of learning resources and activities are addressed.

These first is an example of reflection on work developed and completed in the module on DESIGN FUTURES SCOUTING. The second is a prompt, a type of meta projection and future facing perspective on work developed in the DESIGN FUTURES LEXICON. These two cases are included to take up matters concerning the mediation of design futures and different ways they may be materialised and included to diverse pedagogical ends in our exploratory design futures pedagogies.

The first case concerns distributed collaborative making and is co-written by a team of teacher-researchers from ELISAVA with the work taken up emerging from their specific master's course.

The second case is authored by our project's web and digital designer who participated in part in the development of the LEXICON and offers a speculative take on its possible future. This case thus looks to how we might reconsider work offered and undertaken and provides an optional future that toys with potential and remains at a level of suggestion not direction.

Distributed, collaborative making

BY *Jana Tothill, Roger Guilemany, Oscar Tomico, Guim Espelt Estopà and Mariana Quintero*

Introduction

Considering the current climate emergency and the untenability of our economic system (Cielemcka, 2019), we need tools to address and comprehend the situated and complex singularity of our contemporary existence, creating transversal alliances between practices (Braidotti, 2019). Using a posthuman or non-humanist approach to design, we attempt to be much more expansive and pluralistic in how we understand design. Allowing other actors to cohabit in the centre stage provides a more equitable gaze that enables us to incorporate concepts of relationality, situated knowledge, multiplicity, and intentionality into our design practice (De Paola, 2013). Therefore, de-centring the human opens up new symbiotic relationships with non-humans (Tsing, 2021) and collaborative networks (Haraway, 2016). It provides tools for creating and sustaining healthy assemblages in the design practice (Braidotti,2019) and actualising collective imaginings (Gatens, 2002).

An example in a box, beyond 'boxing'

Nomadic Box [Figure 9] was a year-long research project that sought to understand the life cycles of things from a different perspective, emphasising their agency, highlighting their relevance and impact on the planet, and exploring how this paradigm can create reflections on current designers' practices and processes. This project was inspired by the mail art movement and the avant-garde neo-dada Fluxus movement of the 1950s and 1960s (Harren, 2016). Following the concept of 'fluxus boxes', Tothill and Guilemany used them as containers to collect representational gathered things (Devendorf et al., 2019).

The way *Nomadic Box* worked was: a container was prepared with a set of instructions and sent it to a specific designer through the post; this designer then had 24 hours to fulfil the exercise and send it to someone else. Therefore, the assemblages of intervened objects and reflections were constructed gradually through the extensive and personal networks of the receivers. Eventually, these containers were sent back to the original return address specified on the box with an unexpected collection of things.

The final, 'refined' (and most relevant) set of instructions asked participants to reflect on the death of one of their projects. They were requested to physicalise it, put it in the box and send a written or audio reflection to the number on the box corroborating/

explaining their actions. Of course, to get to this distilled (and to the point) version of the exercise, Tothill and Guilemany undertook several trials. A total of 4 boxes were launched sequentially; we waited to get the feedback of each before tackling the next to be able to incorporate updates and improvements to the exercise.

The last two boxes occurred in parallel and contained identical instructions, to avoid confusion we will address them as a single cluster. These last two boxes had six participants, six dead objects and six audio and written reflections. In these boxes, we found: 'broken glass in a glass jar', 'paper tile', 'broken vase', 'wind-up clock', 'communion book', and 'bumblebee'. The participants of this box consisted of architects, product and industrial designers and a design historian, two females and three males between the ages of 30 and 50.

The method of gathering the collective imaginings remained the same throughout all the boxes. The final assemblages depended on the previous participant's interpretation of the exercise. Therefore, we had no way of knowing who would participate in each of

the boxes; we only had the power to choose the first participant. It is significant to say that there was no explicit mention of any posthumanist concepts at this stage.

Reflections

With *Nomadic Box*, Tothill and Guilemany asked designers to describe the death of a thing they had previously created during their practice in order to trigger a reflection on the responsibility of putting yet another thing into the world (Bennet 2010). They wanted to extend their understanding that their commitment did not end when their creation left their creative sphere. As creators, they had to understand the implications a designed thing would inscribe during its lifetime and at the end of its life.

Nomadic Box enacted a new relationship with objects. The exercise made practitioners experience another agency from their designed objects, foreseeing their biography (Wakkary, 2021) and reflecting on their responsibility as designers. Tothill and Guilemany closed the project by creating a dialogue among participants, bringing together their community of practice to contrast, share, and discuss the multiplicity of reflections they gathered on their futures scouting process, displaying an alternative present to embed post-human theory into the design practice. Their boxes became a tool that would give agency to others and bring them into the design process.

Rendering design futures by other means

BY Andrew Morrison 6 Bastien Kerspern

Collaborative critical pratices

In working on language, web design, futures and the LEXICON part of our collaboration involved our experience and expertise between project and work package leader and a design bureau specialist and project design member. We collaborated as a digital media scholar, applied linguist/designer-researcher with experience in narrative and interaction design and design research, and a games and futures process designer who is a design fiction specialist and design educator.

This was one of a range of designer-educator-research collaborations in FUEL4DESIGN. It built on previous shared design and research work, principally in the adjacent and overlapping artistic research project Amphibious Trilogies into extended choreography via investigating and instigating situated studies of relation between movement, design, media, ecology and socio-cultural practices. Our joint motivation in looking beyond the first tier of resources in the LEXICON was to offer a number of examples of ways it might be taken further. As part of the main interface we included a section entitled 'Renders'. This became a two part (cases and free renders) more openly experimental and gaming inflected, speculative and personally 'wild' focus on terms, contexts and articulations in shaping shared vocabularies of design futures literacies [Figure 10]. It was infused with practice-based experience and exchange and collaboration, now spanning eight years, on Anticipation Studies, interaction design, speculative design futures and design fiction (e.g. Morrison, 2014 - Kerspern, 2018 - Morrison et al., 2021).

Three free renders suggesting ways the DESIGN FUTURES LEXICON might be taken up in different ways. (Credit. I01 FUEL4DESIGN).

REFLEXICOVID
A new mode for the REFLEXICON to explore the links between FUTURES DESIGN words with the Covid-19 crisis.

DESIGNING THE FUTURES OF THE DESIGN FUTURES LEXICON
Two scenarios and a tool to imagine and replay the futures of the Lexicon.

RENDERING SURPRISING FUTURES DESIGN WORDS
An activity on rendering the Surprising Futures Design Words from the Lexicon.

Offering counterweights

These elements of the LEXICON were posed as wider offerings to ways other materials in the project might also be taken up, perhaps re-situated, re-oriented and reinvigorated, more abductively than directively. A core motivation was to suggest ways of motivating further use in which play and oddity, unexpectedness and surprise might offer some counterweight to otherwise at times formal, even dry renditions of design futures vocabularies and literacies.

Central to our thinking was to pursue the interplay between engagement, roles and 'stance'. The Free Render shown here, entitled DESIGNING THE FUTURES OF THE DESIGN FUTURES LEXICON, thus includes two anticipatory scenarios and a sketched toolkit for working with them. In our view, the environment remains 'undesigned'. Marenko (2018: 50) argues that the convention view of design as to do with intentional planning and legible blueprints:

> … is challenged by insisting on the contradiction and the resistance that the problematising complicity between vagueness and contingency brings to design. Vagueness and contingency are here taken as two complementary disruptive forces impinging upon the design process. Vagueness, as the continuity of immanence out of which all things are created through a process of morphogenesis and emergence. Contingency, as its aleatory by-product, the unforeseen terra incognita ensuring that no drive to resemblance, no retrofitting impulse can sneak in and taint the process. As such, vagueness and contingency constitute the undesigned at the core of design.

These various examples of tools, mean and mediation also benefit from being read together. However, we need to also consider relations between the physical and virtual in shaping design futures [Figure 11]. This has been championed in the doctoral speculative design futures product-mediational 'rendering' practice work between creative and expository design futures literacies and multomodal discourses by of one of the PhDs at AHO, Jomy Joseph, as shown across these essays (Joseph, 2023).
To further conceptually expand on imaginary and pragmatically situated relational anticipatory design making and analysis, next we turn to a section on meta-design and futures in design learning.
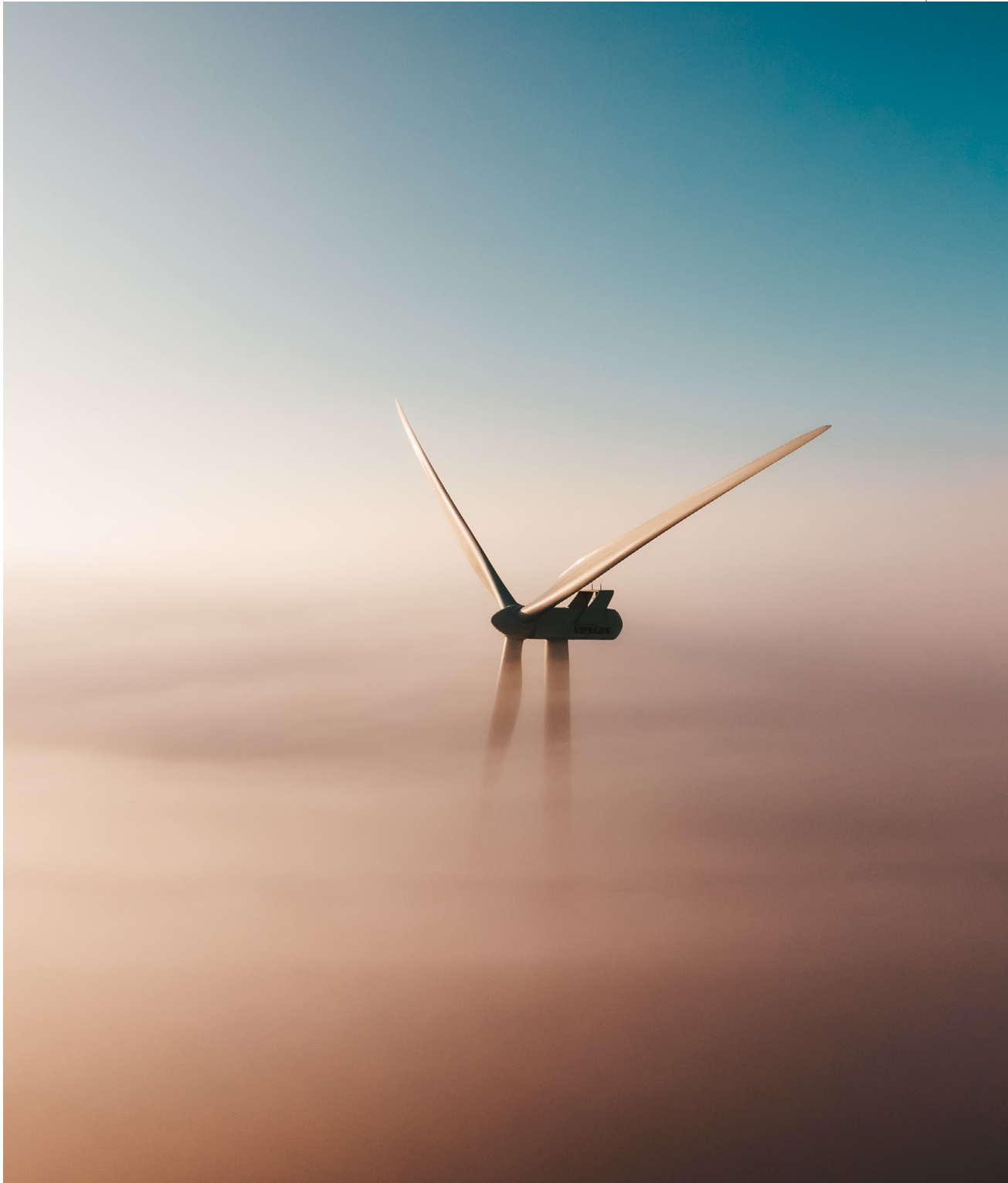
Figure 11 ▶
From Joseph, J. (2022). *The Open Journal of Refuturing*. Centenary Special Issue, Spring 2131. p. 8. (Open Design Society: Oslo). (Joseph, 2023). Both texts are The journal and related PhD thesis are here: **Link ↗**. (Image credit: Jomy Joseph).

6. Elaborating on Meta-design, tools and learning futures
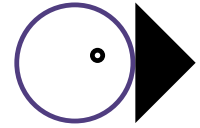
Meta-design as designing design processes

BY Manuela Celi & Chiara Colombi

Framings

Focusing on the mediating role Design has among disciplines (Celashi, 2008a), we can consider the object of the design practice not only the result of the design action, be it a product, a service or an experience, but also the design process itself. We refer to the design of the design process (Celashi, 2008b) as meta-design (Deserti, 2003). The Greek suffix 'meta' means 'through, after, behind, between' and over time it has acquired the meaning of 'beyond, further than'. In the specific context of our discipline, the concept of meta-design refers to the overcoming of the centrality of the design synthesis that leads to a specific result in the designer's actions.

This benefits the understanding of the possible objectives of the design action; of the research, activation and analysis of the information and resources necessary to implement the project; of the understanding of the contextual conditions that could influence preliminary decisions and the following design process; of the formulation of possible implementation trajectories that will guide the 'real' design practice.

Therefore, Meta-design has as its objective not the design output itself but rather the organisation and management of the propaedeutic and preparatory activities for the design practice. The nature of dependence on the context, from which the variability of the Meta-design process derives, rejects the Simonian ideal of the existence of a principle of rationality that allows to correctly represent the objective and arriving at the best solution, considering the design assumptions and the project request (Simon, 1969).

Meta-design is configured rather as a reflexive praxis (Schön, 1983; Schön, 1987). Schön (1987: 13) states that there is 'an art of framing the problem, an art of implementation and an art of improvisation, all necessary to mediate the use of applied sciences and techniques in the practice'.

Learning through the practice of the project and through reflection on this practice defines the phenomenological nature of the meta-design in its adaptation to the context and in the continuous adjustment of points of view and evaluations.

Further, if the design of the design process is influenced by the premises of the analysis, the choices made by the designer act on the context itself, in the process of acquiring and verifying information and modelling a plausible hypothesis that can then be verified through the subsequent design action. Those choices construct the context to the extent of the hypothesis. They represent it - in a philosophical sense of the term on the theme of representation, from Aristotle's cognitive process of abstraction, to the representative activity of Kant's consciousness, up to Sartre's creative powers of imagination - through the interpretative ability of the designer. They explain the motivations that move the designer and their actions through the transfer and sharing of the elaborated contents and the knowledge acquired about the context itself.

Meta-design is therefore a cognitive process that allows us to investigate the context within which the project refers or will refer. It encompasses an output is the proposal of multiple points of view, interpretations, visions from which the project can be founded and take their steps towards a coherent solution to the chosen premises. The Meta-design approach denies the existence of 'rules' and a univocal method for the design practice. As Archer (1979 writes, '… also the design has things to learn, ways to know them, and ways to "make discoveries" on them (…)'.

Meta-design is the method of 'discovery', unveiling the very project that is designed in accordance with the contextual conditions in which it takes shape. In this framework, a multilayered set of tools facilitates this reframing process, exploring the openness of the design practice and its ability to configure design futures. Therefore, future design pedagogies require a situated use of methods and tools, whose appropriateness is defined from time to time. Next we turn to two points of focus: Activism, action, transformation; and Extending tools in re-situated use.

Meta-design and extending tools in Re-situated futural use

In recent years Meta-design has gained traction, with focus emerging, for example, in Human Computer Interaction (Fischer & Scharff, 2000) and through work done in our own design education and research setting. Fisher & Giccardi (2006) focus on Meta-design as an emerging conceptual and collaborative framework for the future of end-user development where co-adaptive, co-design between systems and users is central to shaping dynamic relational settings of acting and knowing, including design. In our own work (Celi & Colombi, 2020), we focused on the uses and potential motivators of design futures knowledge through attention to trends as future prompts in emerging practice of anticipatory designing.

Throughout the increasing complexity of design systems and methodologies, there has been a development of a first phase that initiates this process; Meta-design, the 'project of the project' provides an abstract overview that facilitates the organisation of the given project (Celi, 2012). Coined by Van Onck (1965), Meta-design has been defined over the years as an analytical programme composed of strategic activities, aimed at guiding and constructing the project, defining its framework and meanings by codifying and translating the signals picked up from the surrounding cultural context (Celaschi & Deserti, 2007; Celi, 2012).

Engaging with impact

BY Manuela Celi

One of the interesting growths of the FUTURES DESIGN TOOLKIT was its meta-design and metacognitive application in a EU parallel research. The EU-project called SMOTIES - a four year co-funded project by the Creative Europe Program (Smoties, 2020-2024. **Link** ↗) - aims at working creatively with small and remote places. SMOTIES project belongs to the Human Cities network involving, since 2006, design, art and architecture universities, centres and consultancies. Spanning all Europe, the network acts as a platform of interdisciplinary exchange, examining the liveability of public spaces by using participatory Design as an approach to supply systems of process and innovation.

The SMOTIES POLIMI team used the FUTURES DESIGN TOOLKIT was a meta device with two aims:

- generating intermediate scenarios to start the dialogue within the involved communities and the partner institutions
- developing the SMOTIES Futures Toolbox as one of the outputs of the SMOTIES project.

This related toolkit has been developed to guide the international network of partners of the European project to analyse and understand the challenges of small and remote places and guide local partner institutions in identifying possible futures.

Its aim is to enable creative teams to envision near and far futures for specific contexts, positioning them within a framework of European challenges and defining and assessing specific impact objectives to lead concrete creative actions in the territory.

This side experience revealed a different and unexpected potential of the FUTURES DESIGN TOOLKIT as meta-tool; it functions as a generative engine able to support a research group creating tools in a recursive reflective practice. This novel learning and teaching materials for emerging interdisciplinary and anticipatory practices seem to have the chance to influence and cross-pollinate other disciplines.
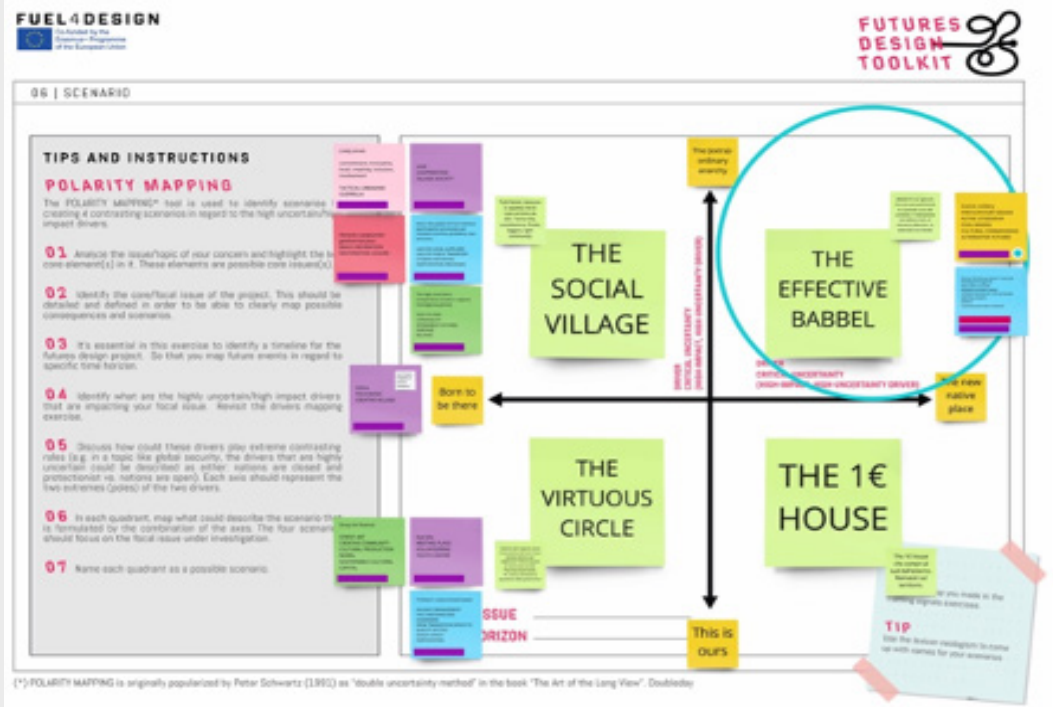
▲ Figure 1: Polarity Mapping, Scenario Canvas, 'Futures Design Toolkit' (FUEL4Design, 2021), Applied by SMOTIES PoliMi Team to develop the SMOTIES Futures ToolBox (above).

▲ Figure 2: SMOTIE final scenarios developed though the 'Futures Design Toolkit' (below).

Meta-design proves to be an essential component of futures disciplines and futures literacy, since it considers a previous stage of design when the project's totality is contemplated and directed towards the future. If we understand design 'as the momentary coalescence of future possibilities materialised today' (Marenko & Brassett, 2015: 6), designers have the possibility of shaping the future by applying a Meta-design approach, by steering their research towards futures thinking.

This master plan consists in the design and definition of the parameters from which the designer will choose the most adequate combination to carry out a project, enabling the codification of 'three main aims of the design practice as problem-finding, problem-setting, and problem-solving.' (Celi & Colombi, 2020:3). The focus is set on problem-setting, i.e. the definition of the challenge to be addressed in the following stages of the project, it is crucial since it provides designers the clarity on how to proceed. In particular when dealing with a longer time span, Meta-design allows to build a framework where multiple futures and possible direction can be envisioned.

Mirroring this praxis in the educational context, Meta-design turns to the triggering of meta-cognitive abilities; it aims at providing students with a work method and could also be described as learning to learn. Design courses that follow a Meta-design approach enable students to experience and reflect upon all the phases of the design process, nurturing their methodology and developing those resilience abilities that enable adaptation to change and uncertainties. The purpose of Meta-design in education could be defined as the development of metacognitive skills and the ability to code and decode information from the context (Celi, 2012).

Working with futures tools in design futures literacies

Researching (into) futures is always a paradoxical matter as Bell (1996) calls it the paradox of futures studies. The paradox comes from the fact that the futures do not exist, so futures itself cannot be a matter of research (Dator, 2018). Adding design to this equation makes it even more difficult to elaborate. However, for the same reason, Futures studies scholars have developed several tools to help in researching into futures where the goal is not about predicting the future but rather to explore different alternatives and possible paths.

Tools for futures research (that were gathered and analysed during the preparation of the FUTURES DESIGN TOOLKIT of the Intellectual Output 4 are tools that support futures researchers in interrogating futures issues taking the present as a site for exploration and problematisation. These tools vary widely from participatory methods to tools that support individual researchers in digging deeper about particular futures issues.

A good example for the tools in futures studies is the CLA (Causal Layered Analysis) developed by Inayatullah (2004), which helps researchers in dissecting emerging issues while avoiding the superficial causes of an issue attempting to uncover the deep roots that created the issue itself. This comes along with other sets of tools such as PESTEL analysis (The Futures Toolkit by UK Government, 2017), CIPHER (FTI, 2020) and VERGE

(Strategic Foresight Toolkit, 2019) which are tools that help in scanning the present issues trying to identify the patterns shaping the future. Another example is the set of tools that help researchers in imagining alternative visions of the futures which are the tools concerned with Scenarios making, developing alternative future paths such as Branching (Beery, et al., 1992) and Futures Wheel (Glenn, 1972) as well as the defining drivers for the futures such as the Futures Forces (FTI, 2019). All of these tools are native in futures research, yet they can greatly help designers in informing their design processes and to better develop more futures-aware products and services.

Upframing Meta-design

BY Manuela Celi & Chiara Colombi

Views from the project

Appling a Meta-design approach to anticipatory literacy and future making by designing requires up-framing intended as the consideration of the overall system of which the activity is a part. This up-framing allows continuous reconfiguration, moving away from a unique future direction toward a wider set of capacities required to identify and design new values and preventing a myopian view. A Meta-design approach applied in reflexive ways on our own research and tools has allowed a couple of experimentations in this sense, a meta-application of FUEL toolkit to a) an educators' course at Tecnológico de Monterrey (summer 2022) and to b) the EU-funded project Smoties to develop their own methodology.

The necessity to reinforce futures literacy in educational organisations, together with the updating of the contents were the main aims for the summer workshop for Tecnológico de Monterrey faculty in Mexico. This was part of a refresher course addressed to teachers from the Architecture, Arts and Design School as a disciplinary update. The course, titled Anticipation: from literacy to pedagogy, was part of a CADI program to add anticipation as a main component of their undergraduate curriculum, establishing the approach of advanced, prospective and speculative design as core educational guidelines. This proves itself relevant considering the transversality of the subject, where the need to create a common ground from which to articulate the different interests of the school should be met.

In this four-day course, 20 faculty members attended the online sessions facilitated by Politecnico di Milano which provided a series of lectures that allowed an in-depth introduction to the topic of Design Futures. This was followed by practical exercises, where each group addressed one specific issue or challenge of interest and implemented some of the tools which were previously selected (see I04). Starting with Horizon Scanning and Future Forces, and followed by Polarity Mapping and Scenario building, experiencing and using the tools first-hand enabled a further understanding of their potential. These exercises led to the introduction of the Educator's Guide where the different pedagogical outcomes were outlined and an understanding of how to apply them in class was detailed. The final session was dedicated to the creation of their own pedagogical path, with specific feedback on their application of the tools and devices, understanding how they would be effective for their class's objectives and aims.

Futures tools elaborated

A good example for how design futures tools can be applied is the SMOTIES Project (Creative works with small and remote places); [→ SEE **FEATURE 7**]. Our joint research team used the futures design toolkit to develop different future scenarios of enabling creativity in remote places.

The Scenarios tool (polarity mapping) was very useful and beneficial for the project, since the research team could easily explain the different alternative scenarios for all the partner institutions. They could help in catalysing the communication of ideas by showing how things could be in different ways. Design and futures are intrinsically connected fields (Candy & Potter, 2019). Both are looking at the futures trying to understand what shapes it and what realities are likely to be our (next) present. That is why it was a natural fit to re-design the tools coming from futures studies to fit to the FUTURES DESIGN TOOLKIT.

Futures tools were used to design the futures design toolkit by bringing disciplinary knowledge from Futures Studies to design and focusing on how the capabilities of imagining alternative realities can be applied to design. The tools were adapted and redesigned to fit to design needs and to bring about design aspects to futures. They were meant to explore the merge between the two fields and to highlight how they could be fused together.

Conclusions

BY Manuela Celi, Chiara Colombi & Andrew Morrison

As designers, we are at the same time part of the problem, that can also be the solution. We are the ones spreading products all over the world without taking into account the impact that they should have and mostly only introducing new stuff. But the matter is that there is also beauty that is invented in those products from many different levels and layers. Futures education in general is connected with a value layer. (Manuela Celi, PoliMI, in an interview with Vlad Lyachov).

Futures design tools and articulations

In this essay, we have focused on three main aspects of reflecting on and motivating for anticipatory design pedagogies. Our interest in tools highlights a need for design educators and students to be far more critical about the disciplinary and positional logics, material and cultural affordances and value inscriptions embodied and communicated by and with design tools [Figure 12].

In terms of means we looked to metaphor to address matters of how poetic, cultural coding and significations may be effected and affected in our educational programmes and interventions in reaching for more equitable, representative and far-reaching civic and societal futures. Design is engaged in needed, difficult and changing activities of its own decolonisation.

Figure 12 ▶
Part of the ELISAVA Master's in Design for Emergent Futures (ELISAVA, IAAC), using the Atlas of Weak Signals physical kit during the second week of the programme. (DESIGN FUTURES SCOUTING, I03). (Image credit: Fab Lab Barcelona).

As Nold (2022) reminds us, as design educators and researches, are now entangled in a politics of meta design in which we are engaged in design re-designing itself. Such a meta design needs to be careful and creative in the ways it works further with design tools, methods and mediations as design schools engage actively in supporting the pragmatics and critical-creative methods of our own making together with ways we access and incorporate the expertise of others outside design.

Futures design with futures design literacies

Although the relationship between Design and Futures have become more intimate over the past decade (Candy & Dunagan, 2017), Futures Design is still in its infancy. Relevant tools and methods need huge efforts to be further developed, explored, tested and validated within design communities to achieve a more coherent output. They have shown to be very relevant in altering the paradigm-shifting students' mindsets (Celi & Harb, 2021). Yet, they need to be formalised in terms of what sort of knowledge they generate and how this knowledge could be utilised within the course of practice and/or education.How such generated knowledge informs the transformative process is the fundamental question we should all ask.

Our role as design researchers and educators is to give a space for futures-aware design process to be a core part in shaping design courses. Futures literacies for design has become an indispensable capability designers need in order to face uncertainty, ambiguity, and the overwhelming environmental challenges with more design-centred responsibility.

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UAL

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APPENDICES.
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CONTRIBUTORS
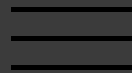
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Palak Dudani is a systemic designer and researcher based in Oslo, Norway with undergraduate studies and work in design in India. In FUEL4DESIGN Palak worked on the design and development of the Design Futures Lexicon and related research on Design Futures Literacies, resource building for designers, educators, and researchers, and diverse modes of dissemination. With a soft systems view on complexity, and a relational and anticipatory approach to futures, her research explores how designers can work with radical systemic transitions in the context of climate crisis. Recent publications look at narrative and metaphors in analysing existing systemic complexities, contexts and conditions. Through participatory projects, events, and playful workshops using AI tools, she has explored how coding place-based narratives into culturally relevant metaphors could be used to imagine, articulate, and materialise radical alternative futures which are experiential, embodied and hyper-local. Palak has worked with humanitarian aid organisations, start-ups, and consultancies on projects in healthcare, transportation and education. She holds a Master's in Service & Systemic Design (Oslo School of Architecture and Design) and has been a recipient of international fellowships and design awards. An elected board member in the Systemic Design Association (2022 –), she is the Nordic Lead for building systemic design capacity within Design at Accenture Song. Please see Palak's personal [website ↗].

Dr Guim Espelt Estopà is a designer, researcher, curator, teacher and learner. His background is in product design, with a special interest in the relations between design and fiction, design methodologies and socio-cultural aspects of design. He holds a PhD with a thesis about the representation of product design practice and discourse in cinema. He has worked in the areas of research and curatorship, creative projects, teaching and knowledge transfer, and organisation and management. He has collaborated with Museu del Disseny de Barcelona, Barça Foundation, ADI-FAD, Apparatu or Studio Suppanen. Since 2017 he has worked at Elisava, Barcelona School of Design and Engineering, where he acts as a teacher in methodological and theoretical subjects, as a Managing Editor for *Temes de Disseny* – the academic journal published by the school – and as a researcher for various European projects. In Fuel4Design, he acted as a Project Member from Elisava.

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Pras Gunasekera is an educator and design researcher. After graduating from MA Industrial Design at Central Saint Martins (UAL), he co-founded Bidean, a more-than-profit enterprise in design and mental health and subsequently spent 18 months co-setting up a design studio at HMP Thameside to co-deliver Makeright ↗, a design thinking for prison industries course. His design practice has a focus on social innovation and utilising design processes to respond to social issues. He is currently employed as a senior lecturer on the BA Interaction Design course at CODE University of Applied Sciences Berlin ↗, where his teaching and learning focus on project-based learning, design research and ethics/ethical design practice. Pras is also part of the academic support team on the Product, Ceramic and Industrial Design programme at Central Saint Martins (UAL), where he is also a Research Associate with the Design Against Crime Research Lab ↗.

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Bastien Kerspern is a French designer specialised in design fiction and public innovation. He co-founded the studio Design Friction ↗ in 2014, pioneering in applied design fiction. With strong experience in designing participatory and playful experiences, he experiments with new modes of design in order to foster organisations' and communities' information, imagination and anticipation. He works with national administrations and local governments in France and in Europe, helping these organisations to address emerging or complex topics, such as smart cities, ageing in place, or biodiversity conservation. Interested in mundane frictions and uncanny narratives, his current works explore how socio-technological transformations and rhetoric of innovation might influence social models. Bastien also carries a discrete, but stubborn, passion for geopolitics. Aside from Design Friction, Bastien is a visiting lecturer on the topics of design fiction and games for futures (L'École de Design Nantes Atlantique, Umea Institute of Design, Oslo School of Architecture and Design).

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Vlad Lyachov is a Norwegian-based landscape architect who has worked on a number of design research projects at the Oslo School of Architecture and Design (AHO), including the NORDES 2017 Conference, Quality for Impact / AHO Research Review 2014-2017 and FUEL4DESIGN (IO6). Vlad received a Master's degree from the Moscow Aviation Institute (State University of Aerospace Technologies). Having started in the joint AHO-UiT programme in Landscape Architecture, Vlad graduated with a Master's in Landscape Architecture in 2017. He has also worked as an analyst in the research department at the consultancy Knight Frank, several landscape architectural offices in Oslo and is currently employed at COWI. Vlad's professional interests stretch from the past (history, languages, anthropology) through the present (architecture, landscape architecture, urbanism and design), to the future (futurism and sustainable development).

Dr Betti Marenko is a transdisciplinary theorist, academic and educator working across process philosophies, design theories and the critique of technicity. She is the author of numerous articles, book chapters and essays, most recently 'Hybrid Animism: The sensing surfaces of planetary omputation' ↗ (2022) and 'Stacking Complexities: Reframing uncertainty through hybrid literacies' ↗ (2021). She is regularly invited world-wide to speak on issues of design, futures and technology. She is co-editor of the volumes *Designing Smart Objects in Everyday Life. Intelligences*, *Agencies*, *Ecologies* (2021) and *Deleuze and Design* (2015). Her new monograph is *The Power of Maybes. Machines*, *Uncertainty and Design Futures* (forthcoming, Bloomsbury 2024. She is the founder and director of the Hybrid Futures Lab ↗, a transversal research initiative developing speculative-pragmatic interventions and world-building practices. Betti is currently Reader in Design and Techno-Digital Futures at Central Saint Martins, University of the Arts London and WRH Specially Appointed Professor at Tokyo Institute of Technology where she is co-founder of STADHI ↗ (Science & Technology + Art & Design Hybrid Innovation), a transdisciplinary Lab working across hybrid methodologies research and knowledge exchange with industry sectors.

Andrew Morrison works in the nexus of transdisciplinary design, education, creativity and research. He is Professor of Interdisciplinary Design, Institute of Design at the Oslo School of Architecture and Design (AHO), where he is the Director for the Centre for Design Research and former coordinator of the AHO PhD Programme. Earlier he led a transdiciplinary research network and design-technology-media-education research at the University of Oslo. With a background in language education, Applied Linguistics, Digital Media Studies, communication and 'development', Andrew has supported critical practice-based design doctoral inquiry across core design domains with focus on compositional, mediational and multimodal methodologies, informed by the humanites and social and computational sciences. His recent research is in Anticipatory Studies and design relatioal futures shaping and study, as well as scholarly communication. He publishes widely within and outside design; contributes to and reviews for a diversity of journals and conferences; and was the chair for the 2017 NORDES Conference on DESIGN + POWER ↗ and the 3rd International Conference on Anticipation ↗. This has built on earlier work in electronic literacies in media, design and education in southern Africa and Norway, extended to PhD education and related research in changing Arctic urbanism and landscapes. Hwas project leader and editor for the AHO Research Review 2014-2017 ↗. Creatively, he works in design fiction and decolonial narrative in shaping social imaginaries, artistic practice and transmodal scholarly communication. Andrew has been the Project Leader for the FUEL4DESIGN project. For details, see Andrew's website ↗.

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Corbin Raymond is a South African designer and researcher. He has an undergraduate degree in Product Design and a master's degree in design from the Cape Peninsula University of Technology, previously lectured in Visual Communication Design at Stellenbosch University and now completing my PhD at AHO, the Oslo School of Architecture and Design. His interest has been exploring how we might design for sustainability, and positioning sustainability by design as a focus area between design - and futures studies. Collaboration is foundational to his design and research practices as he explores how we might design for sustainability. Locally, in South Africa, he co-founded an NGO called, CoGo (Collaborative Governance) that works towards collaborating in a Socio-Ecological Systems context, and internationally he works with the World Design Organization's (WDO) Young Designers Circle (YDC) where the focus is on collaboration on the United Nation's Sustainable Development Goals (SDGs). Recent publications include: Raymond, C., et al. (2022). '<u>Framing scenario thinking in a mode of futures by design inquiry</u>' ↗, in *Proceedings of DRS2022: Bilbao.*

Karianne Rygh has contributed to FUEL4DESIGN as an editor and researcher through work package I06 on the development of the Design Futures Literacies books. As a Norwegian PhD fellow at the Oslo School of Architecture and Design exploring care-based tangible service design for public health, she has collaborated with the Centre for Connected Care (C3), working closely with several leading hospitals and healthcare organisations in Norway. Karianne holds a Bachelor of Industrial Design (Swinburne University of Technology) and a Master's of Social Design (Design Academy Eindhoven), with research experience from the Readership of Strategic Creativity (DAE), part of the Creative Industries Scientific Programme in the Netherlands. Her research centres on the role of design in developing tangible, mediational devices supporting negotiation within multidisciplinary service collaborations. Karianne is a design educator, design advisor and leads her independent design studio. Her recent publications include: Kværner, K., et al. (2020). 'Co-assessment framework to identify person-centred unmet needs in stroke rehabilitation: A case report in Norway'. *BMJ Innovations*, 7: 148-156; and Rygh, K. & Morrison, A. (2022). 'Negotiating care through tangible tools and tangible service designing in emergent healthcare ecosystems'. In Pfannstiel, M. et al. (Eds.). *Service Design Practices for Health Care Innovation*. Cham: Springer. 77-114.

Jerneja Rebernak worked as Project Manager for FUEL4Design and is currently responsible for the research management of the <u>Transforming Collections: Reimagining Art, Nation and Heritage</u> ↗ project, a large UKRI Arts and Humanities Research Council's <u>Towards a National Collection</u> ↗ programme delivered by the Decolonising Arts Institute in collaboration with the Creative Computing Institute – University of the Arts London - and 16 project partners including Tate. Jerneja has 15 years of experience across the Arts, Culture and Higher Education sectors. She worked internationally delivering intercultural cooperation projects including at the Asia-Europe Foundation in Singapore, the European Cultural Foundation in Amsterdam and has been involved as programme manager for the Cultural Centre of European Space Technologies and international coordinator for a large public programme part of the European Capital of Culture - Maribor 2012. She has also served as an Intermedia arts advisor for the
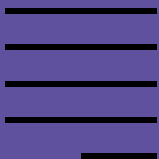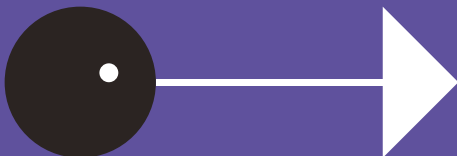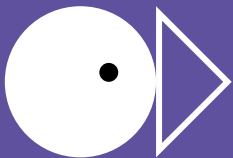
Slovenian Ministry of Culture. In 2015, she joined the Research and Knowledge Exchange Departments at UAL advising on European innovation funding and has managed several European cooperation projects among others T-Factor (Horizon 2020), Fashion-Tech Alliance, Edu4Fashion Tech, FUEL4Design (Erasmus+) and Creative Lenses (Creative Europe). Jerneja is multilingual and holds a BA in Communication Science, University of Ljubljana, an MA in Media Studies, University of Amsterdam, and an MA in Situated Practice from the Bartlett School of Architecture, University College London. Her personal practice evolves across sound, new media art, performance and curating.
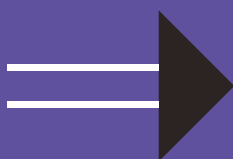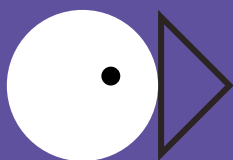
Oscar Tomico heads the Industrial Design Engineering Bachelor's Degree at Elisava, Barcelona School of Design and Engineering. He co-directs the Design for Emergent Futures Master's Program in collaboration with IAAC, and is also assistant professor at the Department of Industrial Design at Eindhoven University of Technology. In the FUEL4DESIGN project he was Principal Investigator from Elisava. His research revolves around 1st Person Perspectives to Research through Design at different scales (bodies, communities and socio-technical systems). Ranging from developing embodied ideation techniques for close or on the body applications (e.g. soft wearables), contextualized design interventions to situate design practice in everyday life, exploring the impact of future local, distributed, open and regenerative socio-technical systems of production, or experimenting with multi-species design and cohabitation as a posthuman approach to sustainable design.See for more information on Oscar's **publications ↗**.

Alejandra Tothill is a product developer, spatial designer and researcher. Alejandra (Jana) Tothill develops her practice at the intersection between academia and industry, between art and design, where digital fabrication technologies, digital literacy and the ethics and aesthetics of information and computation meet, contributing to projects that investigate the rise of the third digital revolution and how information and digital technologies translate, represent and mediate knowledge about the world. In the FUEL4DESIGN project, she worked as an assistant researcher to the Principal Investigator from Elisava. She is currently part of the strategic direction of the Master's in Design for Emerging Futures (MDEF).

Design Futures Literacies

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ED. ANDREW MORRISON