

Jun 25th, 9:00 AM

## Redefining the structure: A design for remote studio learning

Suzanne E. Martin

*National College of Art and Design (NCAD), Dublin, Ireland*

Follow this and additional works at: <https://dl.designresearchsociety.org/drs-conference-papers>



Part of the [Art and Design Commons](#)

---

### Citation

Martin, S.E. (2022) Redefining the structure: A design for remote studio learning, in Lockton, D., Lenzi, S., Hekkert, P., Oak, A., Sádaba, J., Lloyd, P. (eds.), *DRS2022: Bilbao*, 25 June - 3 July, Bilbao, Spain.  
<https://doi.org/10.21606/drs.2022.672>

This Research Paper is brought to you for free and open access by the DRS Conference Proceedings at DRS Digital Library. It has been accepted for inclusion in DRS Biennial Conference Series by an authorized administrator of DRS Digital Library. For more information, please contact [dl@designresearchsociety.org](mailto:dl@designresearchsociety.org).

# Redefining the structure: A design for remote learning

Suzanne E. Martin

National College of Art and Design (NCAD), Ireland

suzannemartinresearch@gmail.com

doi.org/10.21606/drs.2022.672

**Abstract:** Paula Antonelli (2019) stated that it was up to designers to teach the world how to use them well. Taking a change-led, research-informed perspective on designed learning, could encourage future designers “to exercise the acute critical sense that comes from their analytical training in order to help other citizens slow down, stop, reassess, and continue or change course.” (Antonelli, 2019). The sector, and discipline, has a propensity toward disaggregation, to operate as silos that are defined by their distinction. This ultimately makes it harder for the world, for citizens, to feel comfortable using design to make change happen. It is an uncertain scenario, one which has, in a way, created an ideal testing ground for new ideas (Boym, 2010). This paper sets out and discusses a Design Case, a Restorative Learning Thing, as an example of how remote design learning might redefine not only the structures for growing and shaping knowledge, but move beyond inherited notions of disciplinary boundaries within Creative Higher Education. Critically, this paper describes a Design, one that evidences a replicable structure for a new design learning, which, in turn, raises the need to develop a learning framework in further support. It describes the origins, rationale, experience and outcomes of the Design.

**Keywords:** learning design, participatory learning, design frameworks, preferable futures

## 1. Introduction

This paper presents a thin slice of a larger body of research that investigated Participatory Design Learning ‘in the wild’, in multidisciplinary design-led contexts. That larger research project produced a series of ‘Things’ (Björgvinsson, Ehn, and Hillgren, 2010) that became Cases, and provided experiential evidence of dialogue tools, processes and theory, as tested in private sector, and educational settings. The design, delivery and analysis of this Restorative Learning Thing entailed moments of not knowing, and uncertainty, which were only overcome by an active transformation of the situation; the unpredictable design of the learning experienced by students, and the knowledge taken from that, was itself a design process (Löwgren and Stolterman, 2004). Fittingly, design storytelling devices are used in the experience and in this paper to communicate (Ellis, 2004) the research narrative and learning journey of both learner and author/designer.



To test and evidence a way of approaching the design of learning, the model applied the research knowledge gained in the larger research project, in anticipation of the shifts in the sector, and issues that the Design School would address, as it took the lessons learned, forward, beyond the pandemic. Of critical importance were the tools used to deliver, manage and grow knowledge, and the principles that shaped their application. The Recommendations (Section 8.3) describe characteristics that might inform the design of a conceptual framework for creating resilient Design Learning and the understanding needed to replicate this model and continue testing.

Critically, this paper describes that model as design knowledge, as a Design, one that evidences a structure for a new design learning, which, in turn, raises the need to develop a learning framework in further support. It describes the origins, rationale, experience and outcomes of the Design. It also points to the current application of the Design within a Proof-of-Concept Designed Learning Framework.

This paper presents that journey as a Design Case, highlighting the pivotal role that institutioning and infrastructuring play when considering the impact, value and rationale of establishing resilient learning as a culture, as a way-of-working and being in the world, not simply as a by-product of the learning experience.

The research generated, and the larger project which housed it, is currently informing the build of new pedagogical and organisational frameworks for the Creative Futures Academy project at the National College of Art and Design (NCAD), a €10 million Irish Government funded coalition of Higher Education Institutions, led by NCAD in partnership with Dún Laoghaire Institute of Art, Design and Technology (IADT) and University College Dublin (UCD).

## **2. What is the context for this design?**

Abruptly, in 2020, the future arrived. Speculation was mute, the future was now and Design Schools did change because it had no option. Design critic and author, John Thackara outlined philosopher Joanna Macy's proposition for a new emerging story, the 'Great Turning', as a profound shift in perception and the realisation that we are part of a complex of living systems. He describes it as a quietly unfolding transformation (Thackara, 2015).

With the shift from design as object-creation, to design as service for innovation, culminating in design as a service for thinking, private sector design (and the educational component of it) has been part of the Anthropocene, co-opted by the 'Capitalocene' (Davis & Turpin, 2015). Design education and the Design School, as the defining provider of formal, accredited design education, has followed the money (Rodgers & Bremner, 2019). It has introduced industry-relevant programmes training designers to work in Service Design, Interaction Design, Design Research and so on. It equips students with the formulas industry want. As Frank 'Bifo' Berardi suggests in his essay 'Autonomy and General Intellect' (Berardi, 2013) the crisis of the university was embedded in the inability of modern humanism to cope with acceleration and complexity, "The university of the past, as we have inherited it from modernity, is unable to deal with networked intelligence".

Which could explain why we have, up until this moment, created formulas and followed capital. Another point that Berardi notes, one that echoes Roger & Bremner's position, is that the process of privatisation has destroyed the university's autonomy, and thereby it's potential to produce knowledge. If design is to be a "cognitive, pragmatic and political tool" (Antonelli, 2019) and take a restorative role in the change, that starts with the Design School. Shaping learning that supplies the needs of a current system does not encourage change. Shaping learners that don't challenge the contexts around them, does not allow for change.

Whilst we have seen the radical reinvention of some traditional institutions such as the Willem de Kooning Academy (Chabot, 2013) and the Sandberg Institute (de Vet, 2020), design academic Laura Furniss (2015) concluded that the Design School was out-of-touch with industry needs, along with the world's needs. However, schools which err on the radical side of learning, that are independent of the restrictions of Universities and established reputations, often reside at the edge without responsibility to reshape the system.

In 2020, it felt like the Design School had moved beyond disruption and entered a near-fatal crisis. A state where transformation and organisational change could be adopted. Finally design learning could embrace an allocentric position where it could respond to, and act with, isolation in a fluid way of making and being in the world (Renfro, 2009).

### **3. What does the activity look like?**

The Restorative Learning Thing is a model testing a concept for new creative studio learning in Art and Design at Undergraduate and Postgraduate level. It may be termed as a model, or a Design, interchangeably throughout this paper.

It encompassed new learning (type, design and content) within a new delivery structure. This model ran in the optional 'Studio+' year (Level 8) which students elect to do, before their final year, within their three year Undergraduate degree programme in the School of Design at NCAD. The model was designed to meet the School of Design objectives of delivering non-disciplinary, research-led learning for a cross-disciplinary cohort to enhance their final year projects. The students were coming together for the first time, to work in a non-physical design studio environment, with new staff, in the midst of a global pandemic, in September 2020.

The model was tested in this context, in the Studio+ year within the School of Design, in a new 5 credit Thematic module which had just been introduced. That module was delivered alongside an existing Professional Scaffolding module (5 credits) and Real World Projects modules (2 x 10 credits). The school had designated this new Thematic module as an opportunity to bring all design disciplines together, in a transdisciplinary space, to grow and share common research practices, thinking and input. As a space, this, as yet, unformed module was seen as a place to test new delivery and consider future curriculum development, to use the context of compulsory remote delivery across the institution to reimagine what design studio learning might look like.

Testing approaches toward shaping new learning direction, pedagogical and content structures, materials, a reflective student evaluation tool and staff evaluation/analysis approach, the Design itself was complex. Table 1 sets out an overview of the Design to enable understanding, replication and repetition.

Table 1. *Outline of the Design - A Restorative Learning Thing*

---

<b>Background to the Design</b>
The Design put learnings from the overarching research project into practice, in a Design School context. It tested tools, thinking and knowledge from the research project, within a virtual, multi-disciplinary learning environment. It was the first iteration of a framework for learning and cultural props, proposed within the bigger research project.
<b>Positioning of the Design</b>
The term restorative design is usually applied to sensory things that keep users in the present moment, uplift spirits or create a safe space. In the context of developing a new learning model for a cross-disciplinary cohort, coming together in a disrupted wider environment, to undertake remote, research-led design studio learning, a restorative approach was vital.
<b>Participants</b>
23 undergraduate students from disciplines across the School of Design - Jewellery, Fashion, Textile Surface Design, Graphic Design, Illustration, Moving Image Design, Product Design, Interaction Design. Students were required to undertake this module alongside another 2 modules in that trimester to achieve their 30 credit requirement. There were 65 (approx.) students in the year group, they had a choice between 3 projects offered for the Thematics module. Students self-selected a project, based on an introductory presentation from the 3 staff members (who had responded to an Expression of Interest with a proposed project for that trimester).
<b>Delivery</b>
Trimester 1 2020/21 12 weeks learning & teaching 1 day p/wk contact time (100hr student effort hours) 100hrs staff delivery 3 guest speakers (15hrs)
<b>Objectives of the Design</b>
Developing critical, creative thinking that can be applied to real-world, future contexts. Through Participatory Design practices, Design Research (Action Research) and a Phenomenological underpinning (along with other relevant paradigms), students developed their abilities to read, understand and tell stories of place which could frame their actions as future designers.

---

---

### The Design Challenge

---

1. Translating. Taking participatory methods used within real-life experiences into a digital space, for remotely based groups members to work together.
2. Familiarity. Young learners who did not know each other, had no experience of working in an transdisciplinary context and had not worked with a design research brief (or been set specific knowledge sharing and management challenges) before.
3. Differentiation and Commoning. Disciplinary distinction in knowledge levels and type. The school indicated in advance that Jewelry, Surface Textile Design, Fashion had struggled to move from physical making & thinking to remote/digital learning in the previous trimester during first lockdown. Product Design and Interaction Design had depth with digital tools, Participatory approaches to activity and Design Research. Graphics, Illustration and Moving Image struggle to connect research skills learning if not linked to an actual project.

---

### Design Approach

---

- Root learning in a physical, individual experience to provide tangible start-point from which to grow, test and explore new ways-of-working.
- Create flexible scheduling of learning and ways to work and collaborate collectively on time-based activities rather than at activities at set times.
- Design an accessible 'guiding voice' for the learning experience e.g. visual/audio guides & supports, virtual artefacts and texts.
- Introduce learning experiences in advance of the weekly sessions using audio walk-throughs, accompanied by visually led PDFs and text-based documents to meet different VAKT learning needs.
- Prepare schedules weekly – to allow for adaptation and for learning to follow students needs – and to create a sense of 'anticipation' and excitement that happens in a real studio experience.
- Populate classroom folders (audio guides, talks, presentations etc.) in advance of each session to allow time for students to view prior.
- Develop a common, recognisable language for learning activities, challenges and asks that helps students to orientate across the weeks
- Balance learning experience across the weeks to incorporate elements that allow students to design as rehearsal, to work off-stage, to work on-stage with groups and cohort, and cool-down points where they can reflect on the work undertaken.
- Weave conversations, speakers and research resources strategically across the learning.
- Build a tangible connection across group and individual learning, critical reflection and self-reflection.

---

### Design Rationale

---

Instead of trying to replicate the experience of studio learning, online, the knowledge learners needed was delivered using a range of methods, modes and

---

---

approaches. The learning objective was to define ‘change stories’, which seeded the notion that they might apply that to themselves, to change how they worked, thought and behaved.

The School of Design specifically asked for the learning and project not to produce a tangible outcome, for it to be designed as a learning experience in itself.

---

### **Design – the Learning Process**

---

A set of weekly ‘briefs’ (as text-based documents and PDFs) with recorded audio walk-throughs, resources/reference folders (on Dropmark) accompanied activity spaces built in the digital studio classroom on Miro. Groups worked in their own studio rooms (as separate Miro spaces) on their individual activities.

An informal ‘speaker’ programme – talks shared with the other two courses/cohorts in the module – and interviews and structured activities that took place in digital studios/classrooms as groups or studio classes. In combination, the speakers and conversational audio walkthroughs created a soundtrack to individual practices of working, allowing students to pull out whatever was pertinent to their project trajectories, existing knowledge or needs. It also encouraged learning through ‘active listening’.

---

### **Design Evaluation and Analysis**

---

Evaluation happened at a student and learning level within the Design, and as an evaluative analysis approach to understanding the headlines around impact, value and effectiveness as a Design. Heads of Departments took part in the evaluation of the Design, and co-created the impact routes. Developing and testing a co-created evaluation approach, as part of delivering learning within the design, may a first step to infrastructuring this or any model.

---

## **4. What does that look like in practice?**

Design is a non-linear, iterative process. While some design advocates and thinkers regularly point to engineering design models of rigid, gated and sequential process-based paths, or the UK Design Council’s conveniently neat ‘Double Diamond’ as an accurate description of the design process, it is Sanders and Stappers (2008) messy representation of the design process that perhaps, best, describes the designing of learning.

As a reflective designer, my practice is rooted in using personal experience and perspective to understand the research positioning (Goldschmidt 1977), and the Design presented within this paper does indeed question ‘my people’, design educators, and ‘my culture’, design learning, it was very much a self-ethnographic (Hayano, 1979) exercise. However, Reflexive Design assumes that neither the problem nor the possible solutions are given, but are actually created in the process of designing. In contrast, with this Design and context, the problems were known. Over the past decade my professional practice as a design educator, researcher and practitioner, my work has creatively addressed the problems in design learning

within the Design School and private sector. Subsequently, the body of research around this Design was a problem-based investigation. It investigated how a framework for new design learning might be developed and applied within academic and professional contexts. This Design was a first model of that.

#### 4.1 Creating a frame for the design

The Design is underpinned by Rachael Luck's definition of what makes participation in design, participatory design (Luck, 2018) which led to the creation of a set of principles, to Huybrecht's (2014) delineation of Participatory Design process which led to a set of criteria for learning, and to four phases of work-based design learning - identified during a Personal Inventory exercise undertaken with professional creatives to uncover where and how they learned, at work – as shown in Table 2 below. Figure 1, overleaf, details what principles, criteria and Phases applied to the Design.

Table 2. Framing the Design

<b>Participatory Design Learning Principles</b>			
1. Empower Communities of Practice. By finding ways to give a voice to those who may be invisible or weaker in the organisational or community power structures.			
2. Situate Design. Through working directly with people to understand actions actually in, 'in the wild' settings.			
3. Foster Mutual Design Learning. By designing and testing tools and methods that not only encourage but enhance the understanding and learning of participants - through finding common ground and common ways of working within the context.			
4. Design and test Tools and Techniques. That actually, in practical, concrete, specific situations, helped different participants to communicate their knowledge, vision and role/contribution.			
<b>Criteria For Learning</b>			
Enhance conversation between multidisciplinary team members within the context of a project.	Increase the impact and role of interviews, and the data gathered therein, on how projects develop.	Build out from conventional communication of research findings to move beyond storytelling and toward storying.	
<b>Phases of Learning</b>			
Rehearsal	Off-stage	On-stage	Cool-down



The larger research project, within which this Design sits, is built upon a set of guiding principles, adapted from those outlined in Richert and Allen's article on 'Design as critical engagement in and for education' (2017). These principles shaped the Design, its learning content and the delivery of the learning. They are:

1. Design is anticipatory in the sense that it aims to conceive possible futures and to create new, viable options of action (Zamenopoulos & Alexiou, 2007).
2. Design raises the question of 'what might be' or 'could be' instead of only responding to what is (Zamenopoulos & Alexiou, 2007).
3. Design focuses on the "ultimate particular" (Stolterman, 2008), in that it (a) aims to respond to a unique situation, and (b) thereby aims to develop a solution with specific functions and characteristics, which may not work or be relevant in another context or application.
4. Design is a form of conversation with all actors involved in the 'thing' created - artefacts, methods, tools, concepts, prototypes and products as well as the stakeholders (Antonelli, 2019 and Cross, 1999).
5. Ideas relevant to design are co-creations and co-owned - they do not just exist in the designer's mind but are developed, tested and made tangible in conversation with all other actors involved (Cross, 1999).
6. Design arises from a position of not-knowing, and uncertainty - the situation and/or brief, as well as the change being created, are essentially uncertain, and as such 'the design' is identified and shaped by the process of the designing, in itself (Huybrechts, 2014 and Zamenopoulos & Alexiou, 2007).

#### *4.2 The delivery of the design*

The challenge of understanding design learning is a wicked problem (Buchanan, 1992), and this Design addressed that through a range of approaches, but predominantly through the application of a Design Based Research (DBR) (Collins, 1992 and Brown, 1992). Figures 1-8 visually communicate the delivery with detailed annotations within each image and in the captions. These figures provide an overview, samples of pedagogical content, some details of the tools and prompts utilised, and samples of communication and learning activities within the Design.

A Restorative Learning Thing			
<b>Project problem/barrier &amp; participatory response</b>			
<p>To introduce research-led thinking to a multidisciplinary cohort, that encouraged them to work across disciplinary boundaries and develop new forms of structuring their design thinking within future projects.</p> <p>In this newly developed module, disciplinary knowledge was not as important as developing critical, creative thinking that can be applied to real-world contexts in the future. Through Participatory Design practices, Design Research (Action Research) and with learning around Phenomenology (and other relevant paradigms), students developed their abilities to read, understand and tell stories of place which could frame their actions as future designers.</p>			
<b>Aim</b>			
To support students developing 'tools for engagement' which would not only enable them to effectively communicate stories in this project effectively but give them a foundation and changed perspective in their continued studies, which they'd bring into the future workplace.			
<b>Programme objectives</b>			
<ul style="list-style-type: none"> <li>• Generate a collective narrative about, and of, 'place' that enhances understanding of design in context</li> <li>• Encourage responsibility for what is immediate - systems, contexts, implications of actions</li> <li>• Create design connections between place and people, with each other, and the wider context</li> <li>• Understand the implications of design on place</li> </ul>			
<b>Learning objectives</b>			
<ul style="list-style-type: none"> <li>• Building ways of working as opposed to skills-based learning.</li> <li>• Developing empathy and awareness of 'place'.</li> <li>• Understanding what place means and how it manifests in behaviour, actions, decisions and consequences.</li> <li>• Growing a sense of what brings people together, when we are all, increasingly, apart.</li> <li>• Shaping 'tools for engagement'.</li> <li>• Establishing collaboration techniques that can be put in place in multidisciplinary settings from early stages of design project-time, all the way through use-time.</li> <li>• Understanding the needs of teams, users, place and contexts within a project.</li> <li>• Ability to transition from macro to micro views of problems.</li> </ul>			
<b>Date &amp; Duration</b>	<b>Participatory Design Principles</b>	<b>Phase of Learning</b>	<b>Criteria for Learning</b>
Autumn trimester October 2020 - January 2021  8 weeks of learning	3. Foster Mutual Design Learning - by designing and testing tools and methods that not only encourage but enhance the understanding and learning of participants - through finding common ground and common ways of working within the context.	REHEARSAL	(a) enhance dialogues between multidisciplinary team members within the context of a project (b) increase the impact and role of interviews, and the data gathered therein, on how projects develop (c) build out from conventional communication of research findings to move beyond storytelling and toward storying.
<b>Methods</b>	4. Design and test Tools and Techniques - that actually, in practical, concrete, specific situations, helped different participants to communicate their knowledge, vision and role/contribution.		
<b>Activity</b>			
<p>Successfully translating the learnings and activities developed in Cycle 1 into digital, or non-tangible, tools was critical to the delivery of this activity</p> <ul style="list-style-type: none"> <li>• Objects/tools become canvases designed to collect and shape conversations.</li> <li>• Workshops become designed sequence of exercises run in one studio space - verbal or visual prompts are key.</li> <li>• Conversations and dialogues to share knowledge become discussion prompts.</li> <li>• Facilitation becomes audio walk-throughs recorded so it can be listed to, as, when and repeatedly.</li> <li>• Guides and structures are similar in both - but needs more multi-sensory support for digital.</li> <li>• Accessible knowledge sharing i.e.. everybody has access to support research, interviews etc. and can interpret them as they wish.</li> </ul>			
<b>Knowledge/value generation observations</b>			
<ul style="list-style-type: none"> <li>• The project was about changing how to see the world, immediately seeded the idea that they could make changes in how they worked, learned and behaved.</li> <li>• The learning was rooted in a physical, individual experience that provided them with a direct and tangible context to then translate - this acted as a bridge between real/normal pre-pandemic learning and current remote only model.</li> <li>• Multidisciplinary groups required a spectrum of approaches (sensory delivery as well as content delivery).</li> <li>• Flexible timing but detailed activities that were time-boxed - allowed students to re-visit or pick-up.</li> <li>• Using a common language for activities that was recognisable at a glance created equity in the learning.</li> <li>• Followed a rhythm of learning phases - rehearsal, off-stage, on-stage and cool-down learning across the days and weeks.</li> <li>• Pre-loaded classroom with audio guides, talks, presentations etc., and schedule in advance - allowed students to re-visit or pick-up.</li> </ul>			

Figure 1. A Restorative Learning Thing – Delivery Overview. The Design was packaged for presentation to the school upon completion. As a delivery overview, this 'sheet' reports the core elements of the learning, including the problem area(s) it addressed, aims, learning objectives, the methods provided for use in the learning experience, the principles and criteria from Table 1. (section 2.1) that were applied to shape this Design, an activity summary, and observations made during the delivery of the Design.



Figure 2. A Restorative Learning Thing – How Learning Was Shaped. An overview of the learning content and delivery approach, including the student project brief, the range of media and mediums/tools used to communicate learning, and the diversity of ‘voices’ and type of content that contributed to the learning experience of students.

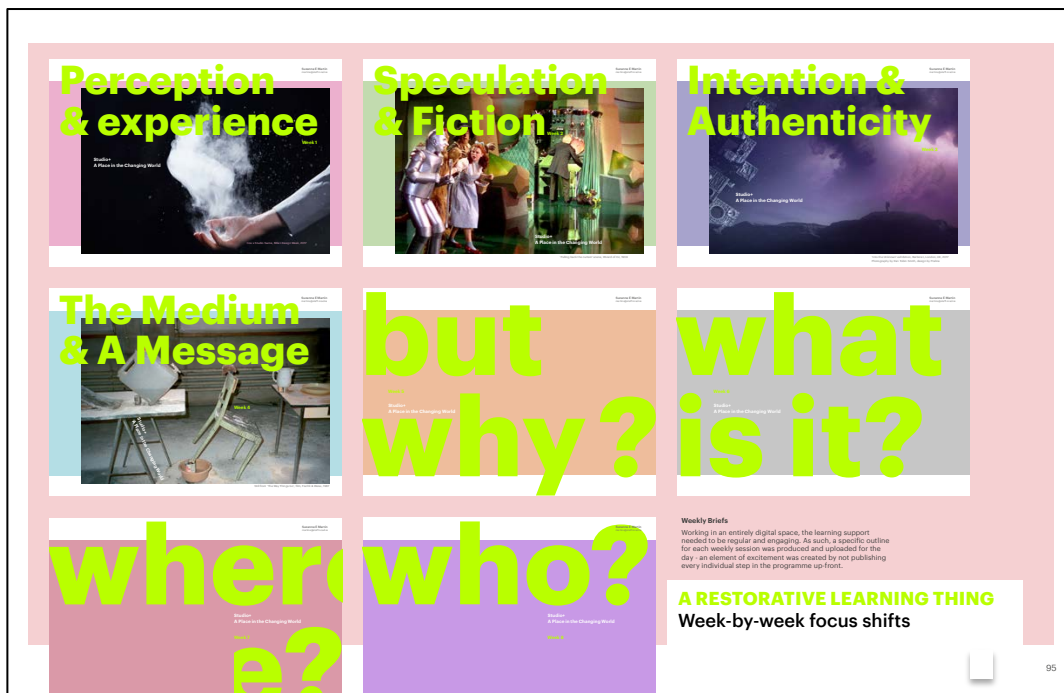


Figure 3. A Restorative Learning Thing – Focus Shifts. Across the module, weekly briefs were visually and conceptually provocative, landing in the classroom ahead of each weekly session. This approach enabled an ‘anticipation’ and excitement often hard to generate or sustain over longer periods of remote delivery.

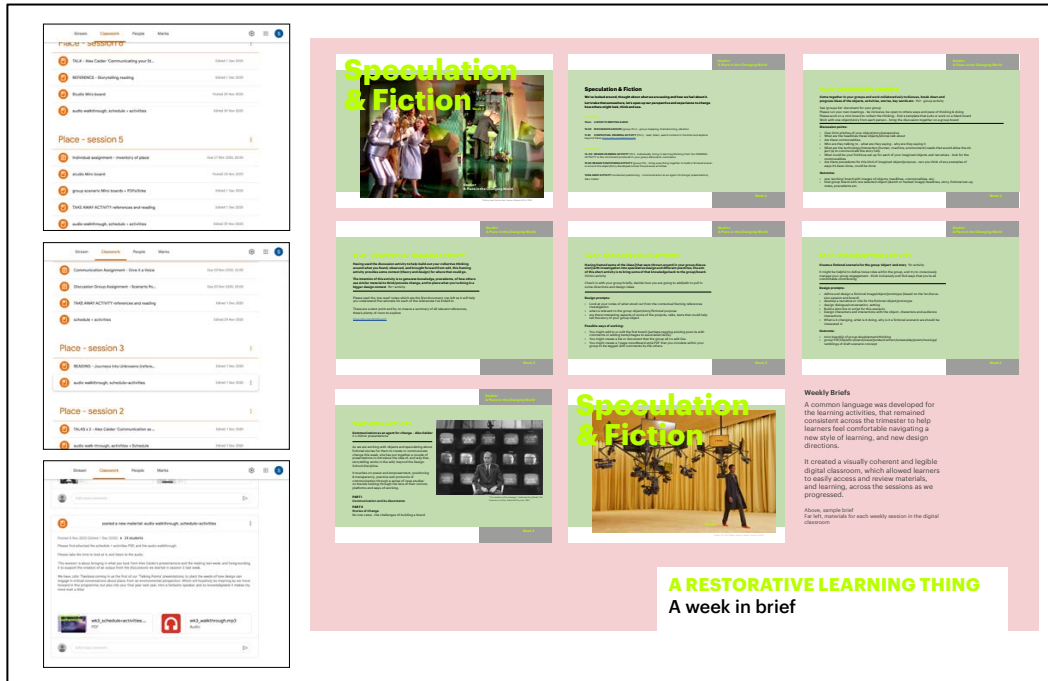


Figure 4. A Restorative Learning Thing – What a Session Looked Like. The communication approach and content were critical to ensuring the virtual studio experience was structured differently to real-life, but also experienced differently. A typology of learning material that spoke to a diverse range of learning styles, availability and abilities was delivered as a package across the range of platforms and media open to us within the institution. This included Dropmark, Miro, Google Classroom, Google Meet, Whatsapp and Zoom.

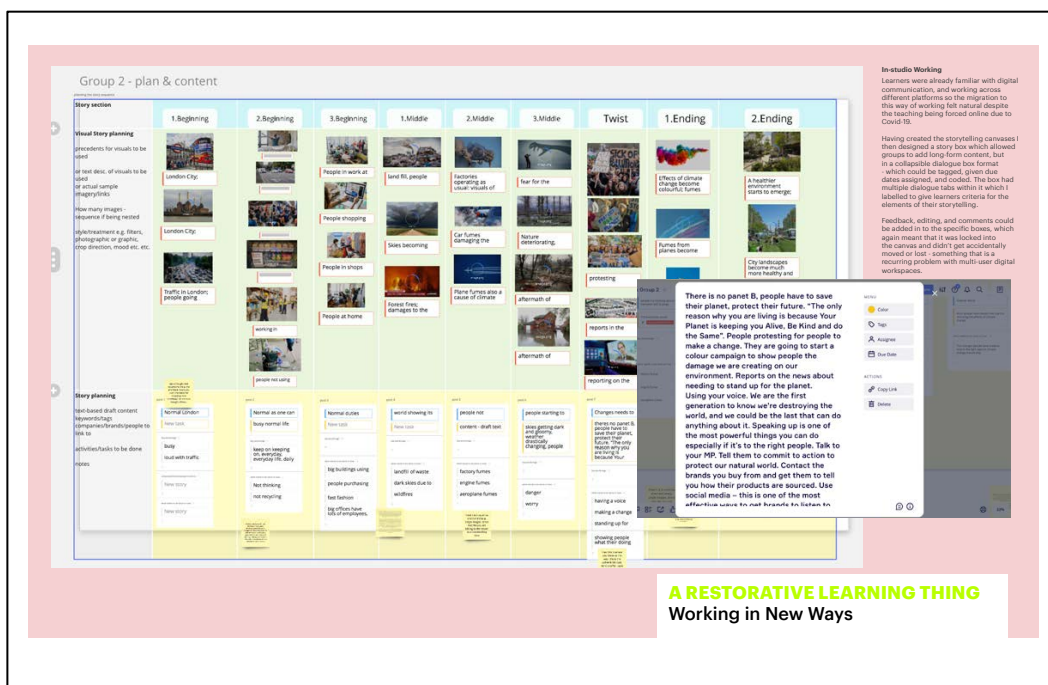


Figure 5. A Restorative Learning Thing – Collaborating in New Ways. Students used custom-designed tools on Miro to enable them to co-create thinking remotely, in their groups. The tools and accompanying activities offered groups visible and open communication approaches which, it was observed, supported and inspired greater critical interaction in the learning activities

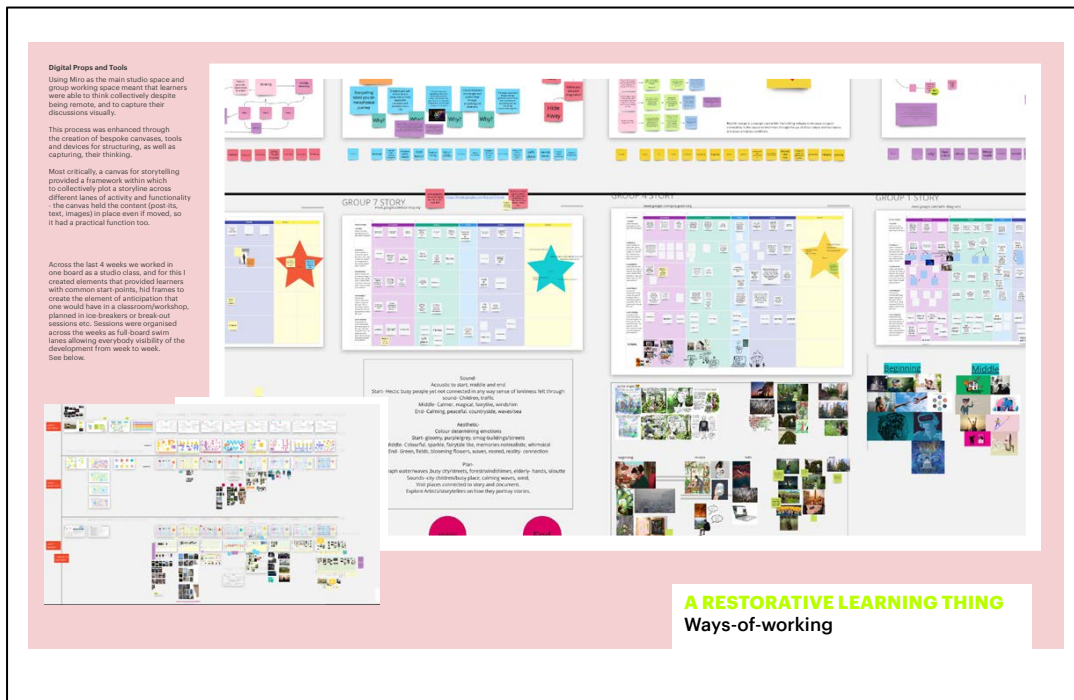


Figure 6. A Restorative Learning Thing – Virtual Studio. Designing ways for groups to work alongside each other relied on customized tools being built in Miro, and adaptation of facilitation techniques to create a dynamic space full of activity. Finding ways or prompts for learners to look around at what others were doing, in real time, whilst working on their own project was critical, it required verbal as well as digital tools and choreographed, timed direction and activities. Working this way, it was observed, enabled a visibility and transparency not found in a traditional studio working environment, or when different disciplines come together to work on projects.

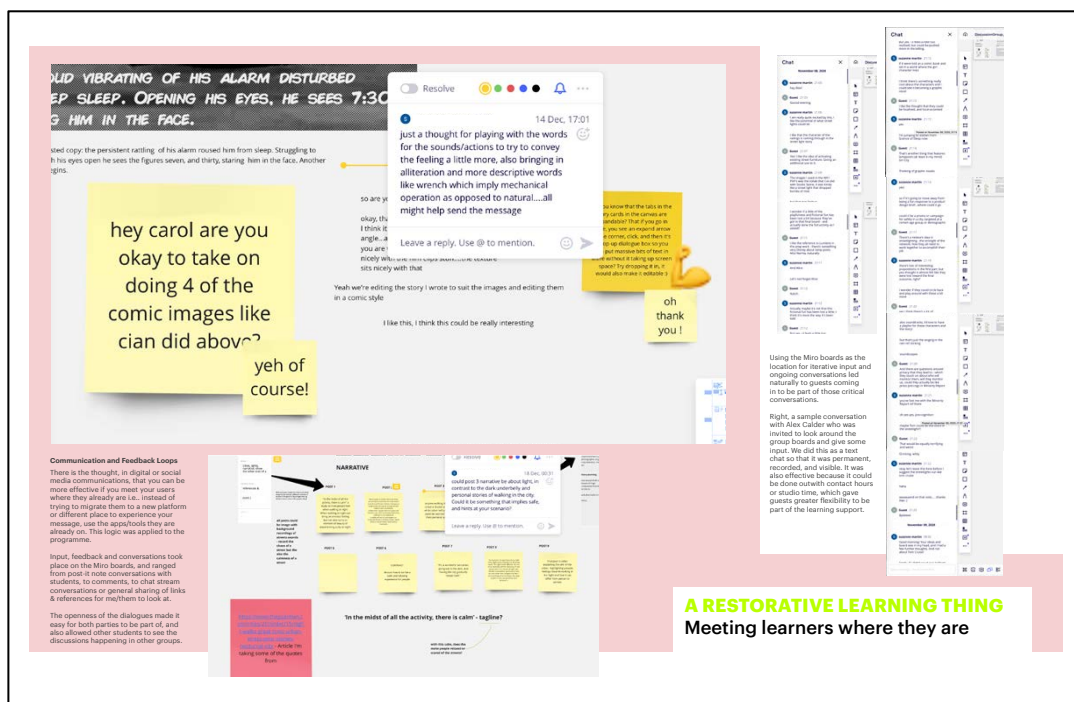


Figure 7. A Restorative Learning Thing – Social Communication. Finding ways to make interaction with the students less formal helped to find a new way for creating a studio community and

culture. One guest lecture came into the chat stream in Miro to ‘talk’ about the work on the board, feedback was given via comments on boards, and post-it notes added in to group conversations.

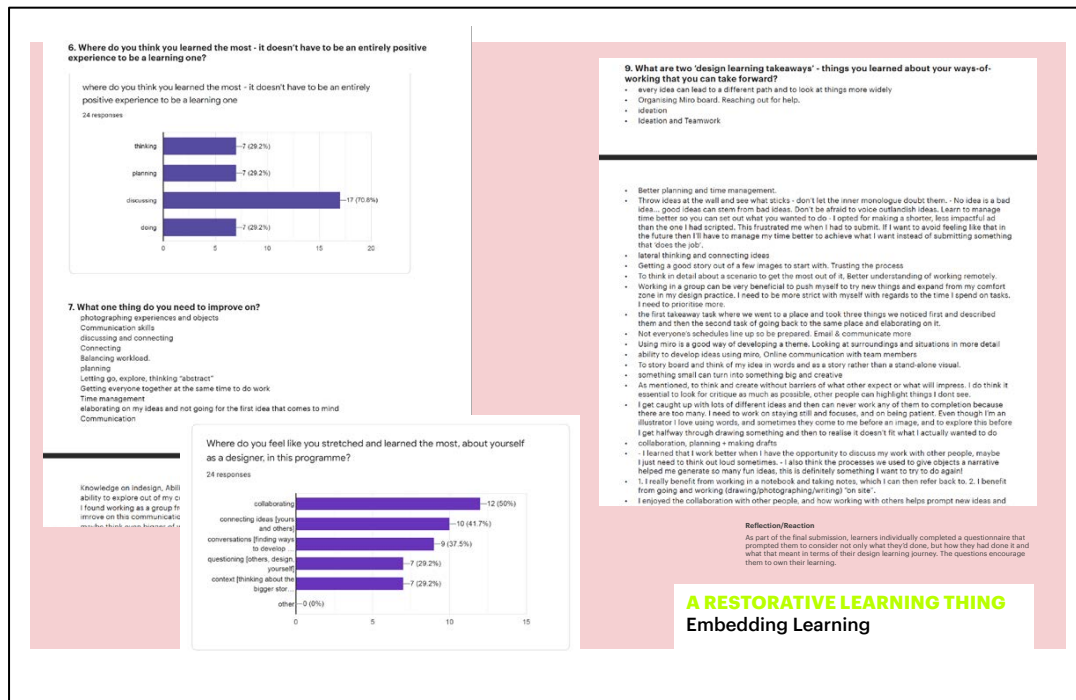


Figure 8. A Restorative Learning Thing – Student Reflection-Reaction Activity. As part of the assessment, students submitted a reflective self-evaluation questionnaire. The structure of this form aimed to embed reflection as part of the creative process, but also to encourage students to own knowledge creation for themselves instead of looking for it to be validated by staff, or by an outcome. It used Google Forms.

## 5. How was that done?

### 5.1 Ways of participating

Design tools are predominantly about generation, with the common objective of supporting thinking processes that can drive and capture ideas, outcomes and directions. They are task oriented unless adapted specifically for a regenerative purpose, as was the case in this Design.

Designers frequently adapt tools, ways-of-working, and thinking, developed in other disciplines to create the infrastructure required for specific knowledge generation purposes within their projects (Koskinen et al, 2011). Many companies reproduce existing design tools and methodologies, with slight modifications to suit their organisations needs - appropriation and adaptation are, arguably part of the design process itself.

The virtual creative whiteboard space, Miro, as used in this Design, is the best current example of how generic, yet far, ‘design tools’ have come from their origins. Miro has rationalised tools, kits and facilitation into templates that any user can choose to apply in their sessions, without requiring any understanding of design, methods, or meaning. However, with

knowledge of design, methods and meaning, Miro enables a dynamic virtual, collaborative, co-creating space. In this Design, the templates and tools designated for task planning or project management were re-designed and used as vessels for tangibly framing and capturing individual thinking within groups, and facilitating group collaboration. In their new form, these became tools for storytelling, storying research and building narratives amongst participants who had very different disciplinary perspectives. Figures 5 & 6 show an example of these in action, populated with student group content.

Danny Jeroense and Olga Potters are advocates of the No School Manifesto, a movement that wants to open up the meaning of learning, and fundamentally question traditional education, through creativity. They ask “How, as a learner, can you tell which tools best suit your characteristics and which ones are suitable for what surroundings and problems?” (Ed. Owens, Camuti and & Stevens 2020), and argue that in order to develop new forms of learning in which creativity is the link, new tools are required. The importance of students being able to curate the tools, processes and ways-of-working, independently, during the project was critical to strong engagement in spite of the pandemic, complexity of the learning and multi-disciplinary cohort. The way that learning was introduced each week, supported by the audio walkthrough, meant that students were not being forced into full-class, camera-on engagement in real-time every week, instead their primary responsibility was to show up for their groups. As a cohort, sometimes a 1 hour session was held in the studio Miro (Figure 6.), where everybody would come together to use the same templates and tools, whilst on their group audio/video calls - therefore they were present in a common studio, but within the ‘safe place’ of their groups. During these sessions, students would regularly be seen moving around to look at other groups work, and then go back to their own, an indicator that there was digital studio peer-learning in the same way as in a physical studio.

Supporting knowledge growth for the explicit purpose of learning and developing common understanding through participatory discussion, is a practice rooted in reflective thinking and sharing (Schon, 1987). There are few tool options that deliver purposeful ‘reflection in action’.

Tools that structure, support and shape learning or sharing through conversation, can readily be found in therapy and wellbeing practices. There, participants in discussions use tools to aid storytelling, communicating difficult subjects and speaking to strangers about experiences - inherently complex subject-matter and conversations. Representative objects, shapes, textures or colours are used as props to guide intuitive and flexible coding that enhances interpretation, language and understanding within these complex discussions.

Design Academy Eindhoven graduate Nicolette Bodewes (2016) created a tactile toolkit designed to be used in psychotherapy sessions, ‘Tools for Therapy’, intended as a “communication toolkit that helps people in therapy express their thoughts”. Bodewes designed the kit – which features two sets of objects, round sheets of paper and a workbook – after her own experiences with therapy sessions. The idea of creating a ‘kit of parts’ that students could use to work on this project, but also take forward into future learning, was a driver for the approach of customizing and adapting existing tools in Miro. A critical component in the ‘kit’

was the concluding self-evaluation activity which students undertook (Figure 8.). This was a device that aimed to embed awareness of their own learning, through a strategic series of prompts and questions. From this it was clear that the learners not only understood what they'd learned, but also the ways that they learned were ones which they wanted to take forward into future projects.

Pioneering graphic designer Bruce Mau argues that the future design workplace is a complex system, that the complexity of problems faced by design requires a different kind of team (Mau, 2020). In that context, therapy and wellbeing tools could positively enhance designing by their potential for carrying multiple meanings, facilitating interpretation and becoming props for conversations between participants from different practices who come together. In this learning experience - where students had not worked together or in a multidisciplinary cohort, or with a project that was about positioning their research – the complexity of the scenario could have been intimidating.

In the Radical Pedagogies project (Colomina, 2015) frameworks of smaller activities were described as creating a network of knowledge that had bigger implications on change. Developing a suite of simple tools to facilitate co-working relied on making these feel familiar, but equally, on the creation of structures to hold the collaborations, visually. All supports introduced could be appropriated, hacked and used individually and in groups studios alongside other media that students brought in. All group studios were open, so all students could move around all the spaces.

Life Coaching has brought some of these tools and thinking to designers and leadership in the past decade (Ackerman, 2020) as it has become more common to use a coach to support career development, or growth in response to a career. Often used for individual, personal learning, they could offer opportunities if applied within team settings where multiple users are involved simultaneously. The teaching in this Design was structured as a 'guide' to learning e.g. talking with groups in the chat stream or via comments (Figure 7.), the use of audio walk-throughs and different styles of guest/speaker input (Figure 2.) which allowed the student to interpret the learning for themselves, as opposed to their learning journey being dictated. Regular studio 'surgery sessions' acted as a prop for addressing gaps or needs in the delivery, these especially helped to understand when the pace needed to be adjusted, and it allowed the learning delivery to follow the learner.

## *5.2 Dialogue shapes collaboration*

Having designed and adapted templates, tools and techniques that pre-existed in Miro and connected those to other media and mediums to form a frame for learning, this Design actively focused on the infrastructure needed to shape dialogues.

This Design sought to develop new knowledge [for the students] about learning [for the larger research project] through discursive design activities, with the creation of dialogues that utilised tangible, digital tools and media to support action research 'in the wild'. Dialogic Design and Discursive Design are emerging forms of participatory design. Innovation researcher Peter Jones, describes this as the "practice of structuring collective language and



non-verbal discourse to enact design processes” (Sanders and Stappers, 2012, p. 252). He argues that the role of dialogue in design research is underdeveloped and that a range of appropriate dialogic methods could usefully be employed in design fieldwork and knowledge translation.

Tharp & Tharp (2013) have played a key role in establishing the field of Discursive Design. They define this category of creative practice as “the creation of utilitarian objects/services/interactions whose primary purpose is to communicate ideas and —artifacts embedded with discourse. These are tools for thinking; they raise awareness and perhaps understanding of substantive and often debatable issues of psychological, sociological, and ideological consequence.” Their work builds upon the Critical Design language of Dunne and Raby (Dunne 1999 and Dunne & Raby 2001), and argues that design can communicate substantive ideas that are relevant to individuals, collectives and society as a whole.

Creating ‘discussion tools’ opens up a dialogue between the designer/researcher and stakeholders within a design project. In the case of this Design, the tools employed built a dialogue between the designer/researcher as educator and students, also between students and design research as a learning context.

A level of deliberate ambiguity and open-mindedness is often leveraged with these discursive instruments, ambiguity allows designers to “suggest issues and perspectives for consideration without imposing solutions... to raise topics or ask questions while renouncing the possibility of dictating answers” (Tharp and Tharp, 2013). The approach taken in the delivery of the learning as shown in Figures 2-7 – the week-by-week activities, conversational audio walkthroughs as a guide for the learning direction, open resources & supports and the design of the virtual studio sessions - embodied this.

Sense-making originated within the communications field where practitioners were searching for new approaches to gain a deeper understanding of communication, through communication-as-dialogue (Dervin and Foreman-Wernet 2003), It is a field that has evolved as a method of thinking to aid designers in making sense of the complexity of design problems with which they work. Sense-Making leverages methods which ask participants to narrate how, when, and where they communicate and how they make sense of information within a particular situation. Examples of typical sense-making tools might be mind maps, visual representations of practice, journey maps etc. Viewed in this context, the virtual and experiential objects, artefacts and props used by Students in the Design could be understood as sense-making tools.

Dialogue is a powerful cognitive tool, it is a bridge between states. There is opportunity to focus in on supporting engagement with design conversations, and through that, learning. Around the topic of design learning, and it’s application of participatory design and design tools, it is clear that there are opportunities to be explored. Most notably around how learning conversations are formed, dialogues are shaped and learning is scaffolded.

## 6. Creating change that lasts

In attempting to institutionalise participatory ways-of-working and ways-of-learning within private sector organisations and Design Schools, there is a need to develop new frameworks and processes that can foster the necessary, sustained, and continuous, dialogue and discourse between disparate Communities of Practice (CoP), over periods of time. These practices can be moved toward becoming Communities of Interest (CoI) where common, underlying thematic themes support innovative design thinking, design doing and design learning.

‘Institutioning’, is an evolving practice addressing the need for strengthened communication between diverse actors within any institution. It has proved effective in improving participatory design by attempting to shift the institutional framing of actors. Institutioning can be described as the “gradual process of altering (consolidating or challenging) existing frames of institutions” (Huybrechts et al. 2017). Successful institutioning requires continuous dialogue between the disparate actors as the shifts in institutional framing occur through “articulating and reflecting on the ways in which various public and private institutions explicitly or implicitly ‘participate’ in Participatory Design and Co-Design processes” (Huybrechts et al. 2017).

The communication, and narratives created with any Participatory Design activity have an important role to play in growing the infrastructures that enable Communities of Interest to work proactively together, and fundamentally, as a mindset for approaching working together. The scaffolding, however, has to be stable. Organisations and educational contexts where Participatory Design is a desirable way-of-working and being, require the frameworks and supports to encourage participatory designing, thinking and learning, to develop. And those frameworks, the infrastructure, have to be sustainable over time in those organisations. The process of infrastructuring, is “characterised by a continuous process of building relations with diverse actors” (Hillgren et al. 2011). Successful infrastructuring can improve communication and build a resilient learning culture by sustaining, embedding and empowering Participatory Design beyond its use within client and/or research activities i.e. moving it toward a culture, a way-of-being.

## 7. Outcomes: What does the design show?

### 7.1 Evaluative analysis

The purpose of the evaluation process in this Design was to understand the opportunities for further learning development in the future. The analysis of the learning delivery, was an intrinsic part of the Design, it included the self-evaluation activity undertaken by students (Figure 8.), and a delivery evaluation analysis exercise (Figure 9., below) undertaken by four Heads of Department in the School of Design. Developing a mechanism for analysing the evaluation process, which captured the voices of those who lead the direction of learning and learners, across the school, was critical. It provided a step toward understanding what pedagogical support infrastructures may be needed to stabilise new learning developments, to institution and infrastructure them for a post-anthropocene learner.

The outcomes of the evaluation and analysis activity were termed as Headlines and Stories. These focused on narrating how tools and methods developed during in-person learning experiences [across the larger research project], might translate into the remote learning experience as digital or intangible props and tools within this Design. These outcomes created insights around the relationship between research and knowledge generation of learning culture/practice in a private sector multinational context, and learning within an educational institution context.

## *7.2 Opportunity identification and stories for change*

The Characteristics of a Learning Organisation (Marsick and Watkins, 2003) shaped activity and analysis throughout this Restorative Learning Thing. Having reviewed and coded other, prior Cases within the larger research project in reference to these characteristics, those opportunities for development had been identified, and incorporated, into this Design.

Some of the analysis themes from the overarching research project became critical in this Design, as shown in the pink rows in Figures 9. & 10. below. These themes and supporting Headlines and Stories aligned to multiple learning characteristics (see the key in Figure 9. for the coding guide) however they have been categorised according to where they have the most potential for future learning impact and subsequent development. Based on the analysis activity undertaken with the Heads of Department in relation to the evaluation process (4<sup>th</sup> column in Figures 9. & 10.) key stories that could be taken forward into future learning development are those connected to sense-making and reflection-in-action opportunities.

Formative insights centered on support - support for knowledge sharing within non-physical team spaces, for growing and developing language to share with, and clear, flexible structuring of this so that it can be adapted and navigated by users independently.

UNIVERSAL KEY		Opportunity Headline & Story			Opportunity Insights + Validation		
Characteristic	Item	Opportunity Headline & Story		Opportunity Insights + Validation			
●	A	<b>Leadership as Knowledge Broker</b>		<b>DM:</b> The analogic approach employed introduced learners to a more playful way of working. Creative practice is frequently playful but this approach introduces a process and tool to help the learner respond, react and explore the potential for changing viewpoints through the use of thought and language.			
●	1	<p><b>1</b> Framing the project direction through strategic language, influenced the perspective of learners. By creating a topic and a progressive approach to learning about it that used language which implied change, experience and feedback learners were encouraged to create and believe in a change-led, open, fluid way.</p>		<p><b>SM:</b> The language used seems open throughout the project and this clearly has supported learners to adopt a flexible and open approach to the project. However, sometimes students of a greater specificity would also benefit the students or perhaps if language needs to be reinforced to remind or build confidence in students ability and their capacity to engage with a more open ended approach. (Chant 2 haven't read the content in great detail but this may be done within course docs)</p>	<p>This model employs a box of modular components that act as very flexible prompts to present a much more open way of working that can be adapted and changed as needed.</p>		
●	2	<p><b>2</b> Creating a real-world, experience-based start to the design journey grounded in a shared experience.</p> <p>Learners began the programme by undertaking a shared learning experience individually. This gave each participant a common experience that they translated from their own perspectives, in order to create something tangible to anchor group and digital work. Sharing with something familiar, and real, left learners open and confident, and they were open to the new ways of learning that followed.</p>		<p><b>SM:</b> Online learning has brought challenges in terms of the initial phase of study projects and the ability to successfully engage students with any new area of learning. The approach outlined offers us new understanding of how practice in terms of framing the project in a space that is understandable but also supports students to engage with new concepts.</p>			
●	3	<p><b>3</b> Re-imagining the role of a facilitator for an entire study given the programme an identity.</p> <p>The experience of remote learning can be isolating and become a block for learning but at the same time, learning in a pandemic facilitated remote progress on individual students. Each week the role was reimagined to fit the needs of the study. This was specifically, communication and connection, as it is difficult in the online or working in a remote, it provided all this personal input, thoughts and direction for each participant to progress as they wished. This re-created audio was effective because learners could pause, replay, re-listen and repeat if they so wished. Our facilitator across a day wouldn't allow them the same flexibility nor would it allow them the control of when they used it.</p>		<p><b>PO:</b> A study one of my own practice provided was very much an educator who used the facilitator mode, where levels of projects and classroom interaction were appropriate to the needs of the study. Learning parameters (unbound to the students) to allow them to explore individual topics in depth to continue exploring to reach the ability to report and share learning to a team. In writing this new model of learning rather than trying to replicate what we did in our previous years, it was clear that we are in a learning phase of iterative learning and will likely take some years to develop modes of delivery that will best accommodate a variety of learning styles.</p>	<p><b>ADIC:</b> Again, the experience of remote learning can be isolating and become a block for learning especially for remote ability and PDGS students. The audio work and conversations take us beyond work that is more of a 'one-way' approach to learning. It is clear that an approachable personal style of delivery that students could relate to and play back, the audio built from week to week which facilitated asynchronous learning.</p>		
●	4	<p><b>4</b> Discussing topics with guests, instead of formal instruction. Informal expert knowledge accessible and reusable.</p> <p>Each week, formal, structured, content areas were discussed by connecting different aspects of ongoing expertise to the topic. Using an informal interview structure, conducted as a live audio session, guest speakers were part of re-created conversations about key topics. The use of asynchronous depth of learning experience directly supporting the learning direction.</p>		<p><b>DM:</b> Having to employ remote delivery, did not hinder the level of support the student received but rather increased it.</p> <p>Both the lecturer and guest lectures were able to support the individual student via two-person Zoom meetings to ensure the content/ topics and ideas were more fully explored together, as a co-creation space.</p>	<p>This approach was trialled in the last academic year and worked well for students. The co-created content allowed for shared thinking and learning out of ideas, and focused Q&amp;A. One of the challenges was face with active delivery to the screen and the limited options for interaction in this project were compelling and added into specific areas through informal structure (guest speakers longer lecture than others designed for students).</p>		

Figure 9. Evaluation and analysis activity 'sheet' detailing the Headlines and Stories that fall under the 'Leadership as Knowledge Broker' theme. The first column contains the coded characteristics of each Headline/story, 2<sup>nd</sup> column is priority ranking, 3<sup>rd</sup> column is the Headline and Story, 4<sup>th</sup> column is the captured input of Heads of Department. Themes are shown in order of identified priority.

UNIVERSAL KEY		Opportunity Headline & Story			Opportunity Insights + Validation		
Characteristic	Item	Opportunity Headline & Story		Opportunity Insights + Validation			
●	4	<b>Shared learning</b>		<b>DM:</b> Exploring new ways of working can be challenging for learners. Finding mechanisms to develop more meaningful thought to enable more creative practice takes and time. In that sense the digital study tools were more than a replacement for traditional face-to-face learning but more of a bridge to a new way of working. The digital study tools were more than a replacement for traditional face-to-face learning but more of a bridge to a new way of working. The digital study tools were more than a replacement for traditional face-to-face learning but more of a bridge to a new way of working.			
●	1	<p><b>1</b> Building a common language for all materials, learning and input made new learning accessible for each participant.</p> <p>Building the programme was not the priority in this session but finding each learner's ability to navigate new ways of thinking and learning, to be confident in generating knowledge was critical. Used consistent terminology, and finding a language system that was simple yet progressive provided a solid structure for exploring learning.</p>		<p><b>PO:</b> Language and the introduction of 'new' language is extremely important to help students develop a broad design lexicon which is a requirement to progress from student to professional. Footnotes for the introduction of terminology can be useful for students who may struggle to understand audio and not comfortable asking questions. Accompanying formalise previous includes and non-judgemental participation and understanding to learning.</p> <p><b>ADIC:</b> The students came from a variety of sources and had experienced different forms of design thinking application to date. The project challenged the students to work in a common language. This was truly important for the students to identify their own cognitive skills and communication skills. More as a tool seems to be vital in the generation of this common language, to allow a simple structure platform to focus on co-creating and collaborating. The students were able to work in a more flexible way that progressed weekly.</p>	<p><b>DM:</b> Exploring new ways of working can be challenging for learners. Finding mechanisms to develop more meaningful thought to enable more creative practice takes and time. In that sense the digital study tools were more than a replacement for traditional face-to-face learning but more of a bridge to a new way of working. The digital study tools were more than a replacement for traditional face-to-face learning but more of a bridge to a new way of working.</p>		
●	2	<p><b>2</b> Speaking to a cross-disciplinary group required multimedia tools and prompts.</p> <p>Learners were opening together from across the Design School for the first time, to work in a cross-disciplinary culture, with different MACE learning styles and needs. Materials to support the learning were created across a range of media: audio, video and social content. Combined with virtual 'tutoring' on Google-meet-ops, the groups received feedback in a range of forms, that viewers on their virtual audio video boards, comments pinned to boards &amp; work, audio notes and visual/ text reference dropped onto boards.</p>		<p><b>ADIC:</b> The variety of learning tools used for learning and feedback were appropriate for the group and consistent with the types of feedback given to other their groups, apart from audio notes which are very beneficial due to the audio studio links. Some students may struggle with formal feedback especially early ability and PDGS students who may find the variety of approach very challenging.</p>	<p><b>SM:</b> Delivering content remotely is challenging but the project users to work successfully throughout a study and to work more as a team. An opportunity to create a shared language, present material. More open presentations (as they) the digital study tools were more than a replacement for traditional face-to-face learning but more of a bridge to a new way of working. The digital study tools were more than a replacement for traditional face-to-face learning but more of a bridge to a new way of working.</p>		
●	3	<p><b>3</b> Designing templates that acted as interactive feedback objects for the group were created and shared with the group.</p> <p>Creating templates for groups to work in, together on Miro provided a structure for their conversations, and helped the development of knowledge sharing and learning in the same way as a founder object might have done in real experience. The templates were versatile practices because they resulted captured the images, texts and input for group members to see and reflect on during the process of the working sessions. They created space and a common start point for all within a shared frame. The work tools were designed based on gaps that had been identified during the learning as an attempt to create opportunity for a knowledge gap. These templates also made leading simple because conversations and developments were anchored in a 'topic' on the board, increased frequency of interaction, thinking and doing.</p>		<p><b>DM:</b> Miro has been adopted across this project and to good use. Templates are helpful learning with this able groups of learners to be guided through what amounts to a very open learning space but given structure, links and information during the way. The approach of pre-structuring should also stimulate engagement and support students to topic. It is intended to see how a remote start experience the affected who engages with which content? How does this affect the learning experience of participants a concern?</p>	<p><b>DM:</b> Knowledge sharing through the use of Miro boards seemed to have worked extremely well. No student gets left behind by their own groups. They work individually and collectively collaborating one another as they get on not very familiar with Miro but once we how would it can be generate and develop diverse ideas.</p>		
●	1	<p><b>1</b> Connecting the programme planning and design activity encouraged peer learning, reflective thinking and drive through transparent working approaches.</p> <p>Miro boards were last open so groups could look around at the work, in the studio board all notes worked alongside each other, on common activities/commitments, and created informal notes open, all students had visibility and could see what others were doing. Using shared visual templates, which could be used to create other groups notes or suggestions if appropriate to share.</p>		<p><b>ADIC:</b> as part of Miro as a tool seems to be part of the generation of a common language in the project. It allowed for a simple structure platform to focus on co-creating and collaborating. The students were able to work in a fluid and flexible way that progressed weekly. This pedagogical approach was beneficial and encouraged students to build an effective design approach.</p>			
●	2	<p><b>2</b> Opening to conversations about group work, making it visible, accessible and allowing the development of feedback loops was positive.</p> <p>Bringing in a speaker to be part of the 'in-board' feedback, as a non-participant in the chat stream was a breakthrough. It was last and early followed by the speaker. Oh, we were able to talk on a call while doing it and the students heard the chat feedback that came out of our conversation in the chat, they got a lot more from it.</p>		<p><b>DM:</b> The use of frequent real time feedback loops has high effectiveness providing students individually and collectively with the information they need to develop their work. This is not always available in the studio. Therefore, the remote learning model employed here works particularly well.</p>			

Figure 10. Evaluation and analysis activity sheet (cont.) showing the Headlines and Stories that fall under 'Sense-making' theme (left) and Reflection-in-Action and Mutual-Learning (right)

### 7.3 Value recommendations

Shaped by the Opportunity Insights & Validation within the evaluation process (Figures 9. & 10.), value recommendations from this Design can be outlined and captured as impact routes for future iterations or models. The Value Recommendations for the design of learning are:

- **Connecting** - Playful, informal and conversational communication enhanced the learning experience by making it accessible to all. The learning material attempted to generate a common language infrastructure, promoting accessibility through familiarity.
- **Experiencing** - Providing a visually-led infrastructure (to both the designing and the learning progress) that felt tangible, was critical to the impact of new, multi-disciplinary and virtual learning. Rooting learning in a physically experienced exercise anchored it to something real, which was important to the success of the virtual delivery.
- **Collaborating** - Co-working, discussing and co-creative thinking are not necessarily things that every learner can do easily, therefore support structures and prompts are needed to scaffold the process of working together, in new ways, and with new people.
- **Iterating** - Creating a learning structure that follows the learner (in the first iteration) encourages it to be responsive to needs, and therefore, through an evolving approach to development, a restorative experience. Basing a learning structure on actual experience of learning is critical.
- **Adapting** - Approaching the learning structure, and direction of learning, fluidly allowed for opportunities to address blocks that came up which enabled a readiness and ability of learners to progress with the programme. Generating weekly briefs in real-time, issued at the same slot each week in advance of the session, created pace, but also the capacity to re-focus, recap or redress elements of the learning experience.

## 8. Designing opportunity: A learning framework

The need uncovered is for Designed Learning to not only be a student experience, but for it to be reimagined as a mode or method for developing, shaping and delivering institutional or organizational knowledge. For that to happen it must move from being considered as either a step in a project process or a disciplinary domain, and instead, be a way-of-working, a way-of-thinking applied broadly across the cultural and creative sector. Addressing this need could further encourage the development and introduction of non-generative tools, techniques and thinking as Design Learning Things that could grow into a restorative learning philosophy, in and for the future.

To build a learning-led culture in any organization, but especially within Higher Education Institutions, the development of a restorative designed learning framework, and dialogue tools - co-created with students using Participatory Design methodology – is necessary. Through this, effective institutioning of a Designed Learning approach could enhance pedagogical delivery

## 9. Conclusion

The opportunity presented with this Design is one for shaping a Designed Learning Framework to support transdisciplinary, team-based thinking and learning. Rooted in dialogic and discursive methods, informed by Participatory Design techniques, the framework could become a fluid structure to support designed learning. Both the opportunity and the need can be met by institutioning Designed Learning within organisations where multidisciplinary teams work together in the transdisciplinary space.

For that to happen, leadership must move beyond managing, and building the ‘business’ and begin to act as Knowledge Brokers. Without brokering, Designed Learning and supported knowledge sharing, organisations and institutions will struggle to address all the challenges of a post-pandemic, post-anthropocene world.

In an attempt to move toward that allocentric place, within the Creative Futures Academy project at NCAD, the Design, as described in this paper, has evolved into cross-institutional infrastructures that support the establishment of a new Designed Learning Framework for the culture and creative sectors in Ireland. It has led to the development of a robust Proof-of-Concept Pedagogical Delivery Framework, and a Proof-of-Concept Evaluation Framework within the Creative Futures Academy project at NCAD during its first academic year, in 2021/22. In this current application, the knowledge, research and experience of delivering the Design has become a mode for shaping, facilitating, interpreting and intervening in, through and for restorative learning for the Cultural and Creative sectors in Ireland. It could very well be an agent of change that Paula Antonelli hoped for in her Broken Nature (2019) essay.

## 10. References

- Ackerman, C.E. (2020). Life Coaching Tools. Available: <https://positivepsychology.com/life-coaching-tools/> (Accessed 7 November 2020).
- Antonelli, P. (2019). Broken Nature: Design Takes on Human Survival (Triennale De Milano). Rizzoli Electa.
- Berardi, F. (2013). Autonomy and General Intellect. Contestations: Learning from Critical Experiments in Education. Bedford Press.
- Björgvinsson, E., Ehn, P. and Hillgren, P.A. (2010). Participatory design and “democratizing innovation”. Proceedings of the 11th Biennial Participatory Design Conference, 41-50.
- Bodewes, N. (2016). Tools for Therapy.

- Boym, C. (2010) Teaching in a Time of Uncertainty, *Design Observer*. Available: from <http://designobserver.com/feature/teaching-in-a-time-of-uncertainty/14378/> (Accessed on 6 September 2020]
- Brown, A.L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The journal of the learning sciences*, 2(2), 141-178.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5-21.
- Chabot, J. (2013). Reflections on Art Education. *Re-Inventing the Art School 21st Century*. WDKA.
- Collins, A. (1992). Toward a design science of education. *New directions in educational technology*, 15-22. Springer, Berlin, Heidelberg.
- Colomina, B., Kotsioris, E., Galan, I. and Meister, A. (2015). The Radical Pedagogies Project. *Learning Network*, 45.
- Cross, N. (1999). Design research: A disciplined conversation. *Design issues*, 15(2), 5-10.
- Davies, H. and Turpin, E. (2015). Art & Death: Life Between The Fifth Assessment and Sixth Extinction in Art. *The Anthropocene: Encounters Among Aesthetics*, ed. Davies, H and Turpin, E. Open Universities Press.
- Dervin, B., Foreman-Wernet, L. and Lauterbach, E. (2003). *Sense-making methodology reader: Selected writings of Brenda Dervin*. Hampton Pr.
- de Vet, A., ed. (2020). *Design Dedication – Adaptive Mentalities in Design Education*. Valiz.
- Dunne, A. (1999). *Hertzian Tales*. MIT Press.
- Dunne, A. and Raby, F. (2001). *Design Noir*. Birkhauser.
- Ehn, P. (1988). *Work-oriented design of computer artifacts* (Doctoral dissertation, Arbetslivscentrum).
- Ellis, C. (2004). *The ethnographic I: A methodological novel about autoethnography*. Rowman Altamira.
- Furniss, L. (2015). *Beyond Discipline: Design Practice and Design Education in the 21st Century*. Strategic Creativity Research Lab.
- Gaver, W.W., Beaver, J. and Benford, S. (2003). Ambiguity as a Resource For Design. *Proceedings of The SIGCHI Conference on Human Factors in Computing Systems*, 233-240.
- Goldschmidt, W. (1977). Anthropology and the Coming Crisis: An Autoethnographic Appraisal, October 2009, *American Anthropologist*, 79(2), 293 – 308.
- Hadfield, J. (2006). Teacher education and trainee learning style. *RELC Journal*, 37(3), 367-386.
- Hayano, D. M. (1979). Auto-Ethnography: Paradigms, Problems, and Prospects, *Human Organization*, 38(1) 99-104.
- Hillgren, P.A., Seravalli, A. and Emilson, A. (2011). Prototyping and Infrastructuring in Design For Social Innovation. *CoDesign*, 7(3-4), pp.169-183.
- Huybrechts, L., Storni, C., Lee, Y., Schepers, S., Schoffelen, J. and Dreessen, K. (2014). Participation is Risky. *Approaches to Joint Creative Processes* (Vol. 13). Valiz.
- Huybrechts, L., Benesch, H., & Geib, J. (2017). Institutioning: Participatory design, Co-design And The Public Realm. *CoDesign*, 13(3), 148-159.
- Koskinen, I., Zimmerman, J., Binder, T., Redstrom, J. and Wensveen, S. (2011). *Design research through practice: From the lab, field, and showroom*. Elsevier.
- Löwgren, J. and Stolterman, E. (2004). *Thoughtful interaction design: A design perspective on information technology*. MIT Press.
- Luck, R. (2018). What is it that makes participation in design participatory design? *Design Studies*, 59, 1-8.

- Marsick, V.J. and Watkins, K.E. (2003). Demonstrating The Value of an Organization's Learning Culture: the Dimensions of The Learning Organization Questionnaire. *Advances in Developing Human Resources*, 5(2), 132-151.
- Mau, B. (2020). *Bruce Mau: MC24: Bruce Mau's 24 Principles for Designing Massive Change in your Life and Work*. Phaidon.
- Ouwens, I., Camuti, F. and Stevens, B. Eds. (2020). *No School Manifesto: A Movement of Creative Education*. Valiz.
- Renfro, C. (2009). *Undesigning The New Art School. Art School Propositions for the 21st Century*. MIT Press.
- Rodgers, P. and Bremner, C. eds. (2019). *Design School: After Boundaries and Disciplines*. Vernon Press.
- Sanders, E.B.N. and Stappers, P.J. (2008). Co-creation and the new landscapes of design. *Co-design*, 4(1), 5-18.
- Sanders, E.B.N. and Stappers, P.J. (2012). *Convivial Toolbox – Generative Research for the Front End of Design*. BIS.
- Schön, D.A. (1987). *Educating the reflective practitioner*. Basic Books.
- Stolterman, E. (2008). The nature of design practice and implications for interaction design research. *International Journal of Design*, 2(1).
- Thackara, J. (2015). *How to Thrive in The Next Economy*. Thames & Hudson.
- Tharp, B.M. and Tharp, S.M. (2013). Discursive design basics: Mode and audience. *Nordes*, 1(5).
- Zamenopoulos, T. and Alexiou, K. (2007). Towards an anticipatory view of design. *Design Studies*, 28(4), 411-436.

About the Author:

**Suzanne E. Martin** With two decades of experience across the design sector and academia, the author researches, designs and develops future-facing T&L infrastructures, systems and directional design programmes. She is currently closing out her role as Academic Lead for the CFA project at NCAD.