Jun 23rd, 9:00 AM - Jun 28th, 5:00 PM

Universities Undergoing Climate Transition: Developing MLP tools from a context- specific and critical standpoint

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Abstract: The emergent field of 'Design for Transitions' (DfT) is rapidly expanding, yet specific challenges and gaps persist. Our research reported here builds on and addresses critiques of the 'multi-level perspective' (MLP), a core concept in DfT and the wider Transition Studies field. We elucidate key design considerations from within our 'live' climate transition case in a UK university – research conducted within a university about the university. Grounded in our 'Research through Design' approach, we present our design and development of MLP tools contextualised for Higher Education and iterated from prior contexts. Contributing to DfT, and to the change-agency of such work within organisations such as ours, we present six 'design criteria' for MLP tools. The criteria are critically discussed and exemplified for their context-specificity and generalisability, elaborating issues concerning the MLP in terms of social practices, agency and power specific to the Higher Education context but also with wider resonance. Towards advancing DfT, this paper addresses the question: What are some key design considerations in adapting the MLP in ways that are theoretically-grounded and widely applicable yet responsive to a particular context?

Keywords: Design for Transitions; Transitions Studies; Higher Education sector; Research through Design; Design Methods

1. Introduction: Positioning 'Design for Transitions'

Scholarship in and practices of 'Design for Transitions' (DfT) are proliferating, cross-cutting several fields including Transition Design (Irwin et al., 2022), Design for Social Innovation (Manzini, 2015), and Systems-Oriented Design (Sevaldson, 2013). Shared across such fields is an interest in socio-technical and systems-oriented approaches as well as a concern for how designers, design methods and tools can contribute to change. However, and perhaps unsurprisingly, the relatively new, emergent and heterogeneous 'non-field field' of DfT is rife with inconsistent terminologies, approaches and concepts. There are knowledge gaps that should

be addressed, for example by integrating technological theories (crucial for understanding systems; see Willis, 2015) and critical social theories (Escobar, 2018) crucial for coming to terms with power (Willis, 2015) and power dynamics in transitions (Wallace, 2020). There are limits to published case studies due to the emergent nature of the field (Sides et al., 2022), resulting in 'how to...' knowledge gaps that can also be complemented by examples of how applications of DfT can respond to context.

Socio-technical and complex (adaptive) systems approaches to change – with the multi-level perspective as a core concept – underpin the wider field of 'Transition Studies' (Grin, 2016) from which DfT stems. Transition Studies is an increasingly broad and interdisciplinary field concerned with long-term, structural and normative change typically on a regional or national societal scale. While there are differences – not least the typically smaller-scale of DfT cases compared to Transition Studies/Management cases – there are also significant common grounds. Geels' (2002, 2018) 'multi-level perspective' (MLP) provides an evolving conceptual model that is a commonly used theory of change across DfT and Transition Studies. The MLP articulates transitions across three levels: the landscape (slow-moving externalities), the regime (stable centre-point of rules and norms), and the niche (fast-paced innovation and incubated experimentation).

Toward further developing the field, critiques have also been identified. Critiques of the MLP in Transition Studies (Genus and Coles, 2008; also briefly surveyed in Zolfagharian et al, 2019) include ambiguity in the definitions, boundaries and relationships between the three levels, lack of attention to agency, power and politics, and a need to be more action-oriented and collaborative. In relation to the levels, Shove and colleagues (e.g. 2012; and Hargreaves et al., 2012, 2013) argue for the integration of social practice theory (SPT) to articulate the role and scale of everyday practices (and, notably, the role and scale of design). Geels and Schot (2007) acknowledge the 'global' nature of the MLP and its lack of attention to the role of actors and their specific contexts or "local sub-plots"—the deeply localised and highly contextual aspects of a project. Critiques of the MLP carry forward into Transition Design where the MLP is used to structure processes (through a 'canvas' tool) to map the historical evolution of a problem (typical in Transition Management) and to explore opportunistic points for intervention within the problem-space (Irwin et al., 2015).

Aligned with other researchers in design and beyond, our aim is to further develop DfT scholarship and practice. We articulate our approach to the MLP as grounded in theory from and responding to critiques within Transitions Studies. We blend MLP and complex adaptive systems (CAS) approaches with relational thinking (Macy, 1991) and Indigenous Knowledge (Yunkaporta, 2019) to support an attentiveness to how systems/subsystems are approached and bounded, how we engage with context, relational qualities, interdependencies, and interconnectedness. More specifically, here, we discuss how our design of a tool 'translates' the MLP into practicable forms suited to action-oriented and collaborative processes. Further, the tool redresses some TfD gaps related to power and agency, both in terms of how these can be considered as topical issues within transitions at regime-and practice-level and in terms of enabling stakeholder participation within transitions processes. Building on prior

work in other contexts, this tool has been adapted for the context of Higher Education (HE) for application to the climate transition of our own HE institution – University of the Arts London (UAL). As we finalise our 'live case' of DfT, we recognise the value of such in-depth research and, when put in relation to wider research and our own prior work, we see an added value to broader reflection.

This research builds on substantial prior work of lead author Wallace (2019, 2020, 2021, 2022), which was also concerned with critically addressing DfT common grounds and common critiques, particularly focused on the MLP as a driving theory of change and as a tool for practical application and participatory processes. Wallace has published insights into applications of their adapted MLP in the contexts of consumption and waste (2020, 2021), food security (2021), and diversity and inclusion in the STEM discipline (2022). This prior work established the usefulness of the MLP as a tool for problem mapping, articulating leverage points, demonstrating multi-level action, and for systems storytelling, and each application was designed with particular criteria in mind. Those criteria inform this work and are critically developed within the HE context for application in UAL's climate just transition. Thus, through deepening knowledge within a particular context and a particular tool, we contribute here to design-specific considerations for practicing DfT in ways that also have wider resonance with the common ground and critiques across the field(s).

2. Our approach to DfT in the context of higher education and UAL

The question we address in this paper is: What are some key design considerations in adapting the MLP in ways that are theoretically-grounded and widely applicable yet responsive to a particular context? We report here how we have designed and developed tools for stakeholder participation through a Research through Design approach in a 'live case'. Theoretical and context-specific concerns have guided the work, for example in decisions concerning boundary-setting (in terms of systems and levels), selection of participants (and thus levels and practices in focus) as well as tool adaptation. In our 'Research through Design' approach to the MLP tool(s), we address common features of DfT (such as the 'multi-level perspective') as well as common critiques concerning the levels (more specifically, 'regime' and more micro 'socio-cultural practices'), power and agency (particularly those characteristic in HE), and more specific features of our UAL context (e.g. how a context-specific ecosystem of climate-related action is being 'made visible').

Our work recognizes the relative paucity of systemic (climate) transition work in the context of Higher Education, including a lack of methods and tools for 'change-agents' (Priyadarshini and Chirakkuzhyil Abhilash, 2022). As elucidated in org studies and other fields, HE has specific characteristics that are relevant to a multi-level approach that is sensitised to social practices and power. Aligned with CAS, we thus see HEIs as adaptive and capable of evolution, not as rigid units subject to mechanistic 'feedbacks and demands' from society or from the top (Priyadarshini and Chirakkuzhyil Abhilash, 2022), and we contribute theoretically and practically to the tools available for change-agents in and through DfT.

1.1 Other relevant work on (sustainability) transitions within the HE context

In the HE context, we note a limited amount of published transitions work in general to date, which has typically focused on either the macro 'national' landscape or the niche of course/program curriculum (Boehnert et al, 2022). The former is more typical of HE sustainability or climate transitions in HE (for example, Deleye et al, 2019; Ferrer-Balas et al, 2009; Radinger-Peer et al 2021). Articulating a transitions framework in which HE is a "societal subsystem," Stephens and Graham (2010) study enabling and disabling factors in universities at three scales: society wide, within the HE sector (e.g. national policies, assessment frameworks, and disciplinary standards), and at a university-community scale (local policies, regulating learning intentions, and faculty ethos as well as 'bottom-up' actions where change is incremental and can be invisible. Institution-centred sustainability transition initiatives (exceptions include Ramisio et al, 2019; Loorbach and Wittmayer, 2024) at a scale like ours are rare.

Beyond transition studies, others highlight some relevant characteristics particular to the HE sector and HE institutions. In terms of power and agency, organizational studies and change management scholars argue there are multiple co-existing, competing and potentially contradicting governance logics, including a state-control model, a Humboldtian model of academic and collegial self-rule, and an Anglo-American market orientation (Dobbins et al, 2011; 'Clark's triangle' e.g. Clark, 1983). Multiple logics reflect multiple 'knowledge regimes,' (Bleiklie, 2005) and 'path-dependencies' (Ramirez and Christensen, 2013). Leadership scholars expose HEI-characteristic tensions in the 'allocation of autonomy' and forms of leadership that are distributed and relational (Sewerin and Holmberg, 2017). Scholars of mid- and micro-level management highlight the multiple allegiances of academics (to 'collegial' and 'disciplinary' communities beyond/outside formal groups such as departments) (Roxå and Mårtensson, 2014), and HEI change-agency through 'entrepreneurialism' of middle managers, administrators, and academics. Though typically more aligned with a 'soft systems' (Meadows, 2008) theoretical paradigm than CAS-oriented transitions approaches, such org studies do illuminate HE context-specific features relevant to multiple levels ('regime' and 'socio-cultural practices'), power and agency.

1.2 University of the Arts London (UAL) pilot research project

Within HE in the UK, our research is conducted within a university about the university, specifically a 'live case' at University of the Arts London (UAL). The *UAL Climate System Mapping* is a 1-year pilot project conducted by researchers (the authors) and additional team members employed at UAL. An institutional driver for the project is the commitment to net-zero emissions across scope 1, 2 and 3 by 2040 and scope 1 and 2 by 2030 in UAL's Climate Action Plan (UAL, 2022) and UAL Strategy 2022-32 (UAL, 2022). Beyond science-based targets, UAL's social purpose and anti-racism strategies motivate a 'climate-justice' framing. Research questions for the pilot include (1) examination of UAL's current climate justice contributions, including both extractive and regenerative aspects, and; (2) pathways and trajectories toward a regenerative climate just future. In short, 'what is…?' and 'what if…?" (Fig.1).
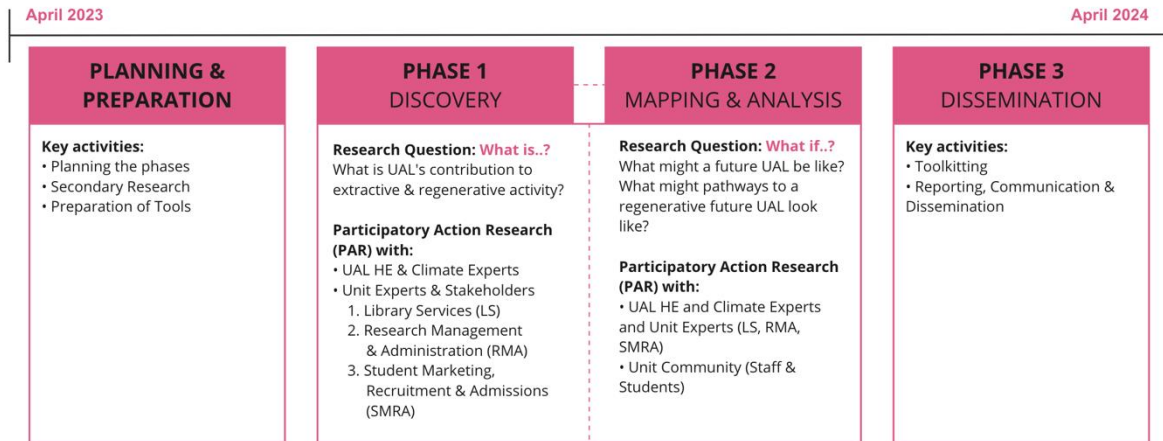
Figure 1 Phases comprising the pilot research project UAL Climate System Mapping

In the pilot, our methodological approach is primarily qualitative research, specifically Participatory Action Research (PAR), and Research through Design (RtD). Though the PAR aspects of the project are out of scope for this paper, overviews of participation are contained within Figures 1 and 2.

1.2 Research through Design approach to MLP tool(s) in the pilot

Our Research Through Design (RtD) entails careful development of theory-grounded and visually composed tools. Ten tools were developed and used in the pilot by or under the guidance of Wallace. Tools were iterated through a nimble 'make-test-reflect-respond' RtD approach and multiple experiments enabled iterative improvements. Our RtD included design development of individual tools as well as their combination and sequencing as a toolkit (process design) which was used across the focus groups/workshop. Tool design and development was informed by our/Wallace's prior research, including design criteria from previous projects as well as adapted and new criteria. Contextualised tool design for HE was necessarily accompanied by clear research questions, process objectives, and consideration of how, where and when to customise tools with HE/UAL-specific terms and information.

Each tool was designed as a 'canvas', (a digital page or printable poster) to achieve a set of objectives. Canvases comprised of headings, instructions and discussion prompts, and graphic elements that helped guide/cluster/map responses using communication design principles (space, line, shape, type, colour etc). Select canvases were pre-populated with additional information (statistics, historical events, known examples, etc.) gathered from secondary research methods (e.g. literature review or document analysis) or from our analysis of prior related primary research. To respond to our research questions, we adopted, adapted or designed a variety of canvas-type research tools (Fig.2).

Research Question	Participants	Objectives	Tools
What is?	Unit Experts & Stakeholders	• To position the unit and its stakeholders	Stakeholder Map
		• To understand the unit work practices in relation to climate dimensions • To identify relevant documents	Dimensions of Work Practices canvas
		• To understand the agency of the unit	Agency-matrix canvas
		• To identify and validate sustainability/climate initiatives relevant to the unit. • To map where identified initiatives are located in relation to the unit	MLP-action-ecosystem canvas
		• Track the stage and progress of identified activities and initiatives.	X-curve canvas
	HE & Climate Experts	• To identify and map key decisions, drivers, actions affecting climate action/justice in UK, HE and UAL	MLP-problem canvas
	Community - Staff & Students	• To identify negative/extractive impact in the daily practices/experiences of UAL • To map these against climate dimensions • To identify some connections between multiple dimensions	Dimensions of Extraction canvas
		• To identify and map positive/regenerative activities and initiatives in UAL • To specify the status, position and level of these	MLP-action-ecosystem canvas
What if?	HE & Climate Experts	• In relation to multiple future scenarios, to identify HE/UAL-specific characteristics • To speculate on the university's current trajectory in relation to such futures • To articulate some existing/missing characteristics of UAL in such futures	Multiple Scenarios canvas
	Community: Staff & Students	• To sense-check the desirability of the regenerative future university • To generate some ideas about characteristics of the regenerative future UAL	Regenerative HE/university canvas
	Unit, HE & Climate Experts	• To "step into" multiple possible futures of the university	Multiple Scenarios
		• To map out future pathways and actions to a 'regenerative' climate future UAL	MLP-pathways canvas

Figure 2   Tools designed for participation according to project-level research objectives and questions

An advantage of our RtD approach (given the limited time and scope of the pilot) is the nature of tools as an interface through which information from secondary and primary sources can be collected or generated, validated or sense-checked, and, to some extent, collaboratively analysed. Outcomes of this project include HEI/UAL-specific findings about our methods and tools as well as more general 'design criteria' to consider when adapting and specifying such tools to other contexts. To further elucidate these outcomes, we will explore through a close-up of one tool (MLP) in the next section.

3. Design considerations and criteria for the MLP as transition tool

Multiple types of MLP tools were developed for application in the pilot for purposes of data collection about the past and present situation ('what is?'), to explore possible future actions ('what if?'), and, generally, to specify and visualize (eco)systemic aspects of climate justice. Our approach to tool design is grounded in transitions, CAS and social practice theories, and considers common critiques concerning the levels, power and agency (particularly those characterised in HE), alongside specific features of UAL's context. In this section, we focus on some key design considerations for adapting the MLP and in doing so, respond to the research question in this paper.

Wallace's prior work adapted the MLP to include two new 'levels': ecology and mentalité — theorised in Transition Studies/Management (2020, 2021) and made practicable by adapting the Transition Design canvas (2020, 2021, 2022). The ecology level situates the MLP in a living systems context making explicit where activity from the socio-technical system is impacted by and impacting upon the living system. The mentalité level recognises the complexity of people in systems, by mapping ideologies, mindsets, attitudes, beliefs and values

alongside cultural frames that influence and are in turn influenced by the multiple ways people think and feel about things. Applying these adaptations in projects within other contexts informed further structural development of MLP canvases (2021, 2022) to include temporal views of the past, present and possible future and views of multi-level approaches to action. It is evident from Wallace's early work that using the MLP-structure as a constant enables shifts in the purpose of the canvas, from mapping a problem (MLP-problem canvas), to investigating leverage points, interventions and transition pathways (MLP-pathways canvas), to ideating/documenting multi-level actions (MLP-action-ecosystem canvas).

Here, in the context of HE and specifically UAL's climate just transition, further advances are made through iterations of three MLP canvases: the MLP-problem canvas builds a shared understanding of UAL's extractive activity; UAL's regenerative activity is made visible through the MLP-action-ecosystem; and the MLP-pathways canvas is articulating multi-level transition pathways to a community-led vision for a regenerative future. The structure of the MLP underpins each canvas, enabling the MLP as a theory of change and a theory of action.

For different purposes and applications, discussed further below, adaptation of the canvas design can enable greater social learning during focus groups and participatory mapping sessions. For example, in Wallace's prior work, early iterations use descriptive labels to remind participants of the 'definition' of each level and reduce their cognitive load, however, in later iterations, labelling evolves from a facilitation aid for participants, to informing participants through the context-specific communication of bespoke and situated knowledge (see Fig. 3).

ITERATION 4
Defining the level to aid facilitation and to reduce cognitive load during mapping

REGIME
The fabric of a society, its rules and norms and how these can influence the daily practices and behaviours of people within a system. This includes aspects of organisations and of people's everyday lives. The regime is a very stable part of the system.

ITERATION 6
Contextualising language for a specific application in STEM discipline

The regime is a scale that includes aspects that relate specifically to your institution, company, or region.

ITERATION 9
Contextualising language to further position 'regime' with more sepcific relation to HE/UAL

Regime

Everyday life in HEIs/UAL

This level maps the things that make up the fabric of life in HEIs/UAL. It is largely focused on the institution's day-to-day operations, particularly the ways people work (in teams and departments) and their every day behaviours, including the practices (or habitual actions) that are embedded and enacted through these teams and departments.

This is a very stable part of the system where social norms dictate behaviours.
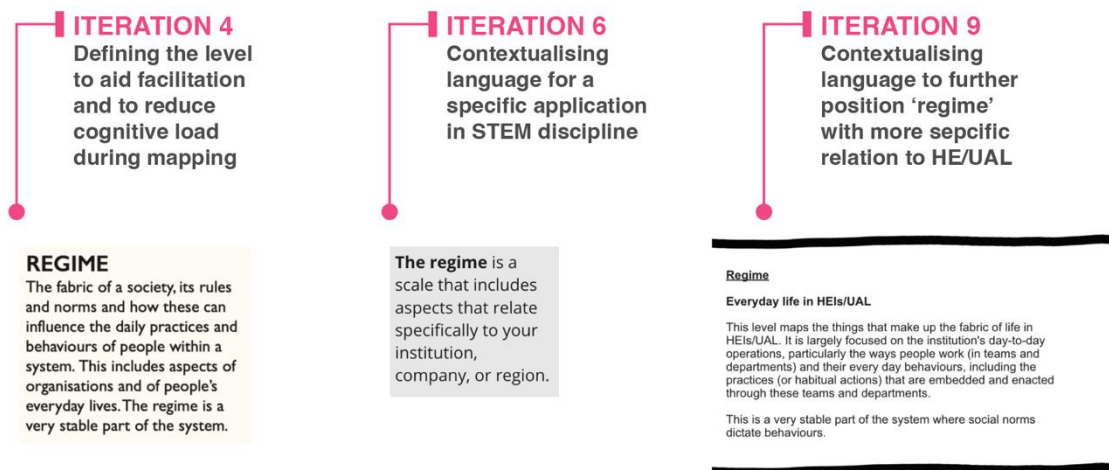
Figure 3   For different contexts of application, the MLP is adapted to reflect decisions regarding boundary-setting, selection of participants, and context-specific characteristics. The figure shows iterations of labels for MLPs used in different contexts to demonstrate adaptation.

3.1 Three adaptations of the MLP

To address critiques of the generalised 'global' nature of the MLP and of design's engagement with this theory we present an explicit set of criteria for consideration by designers to

contextualise the MLP. We are attentive to power and agency and how these can be explored through MLP canvases as part of design for transitions. This research revalidates and builds upon Wallace's prior work by providing new insights through an iteration of the MLP for application in a HE context. Below we present the three MLP tools/canvases (Table 1).

The MLP structure acts as a constant across the canvases which theoretically underpins each canvas to guide understanding of the problem space and how strategic multi-level actions might intervene and evolve as strategic pathways of action. Each canvas works with specific design criteria (presented in Table 2) that ensures the canvases respond to the HE context through structure, purpose and functionality.

Table 1   MLP Canvases

Canvas Type	Purpose and Application in the Pilot	Designed Canvas
MLP-problem canvas	To explore past and present conditions of a problem space. Pilot: To explore UAL's contribution to extractive climate justice activity.	
MLP-pathways canvas	To explore multi-level pathways for transitions to other possible futures. Pilot: To explore four regenerative pathways including 7th generation governance, fossil fuel phase out, reparations in action and biodiversity positive.	

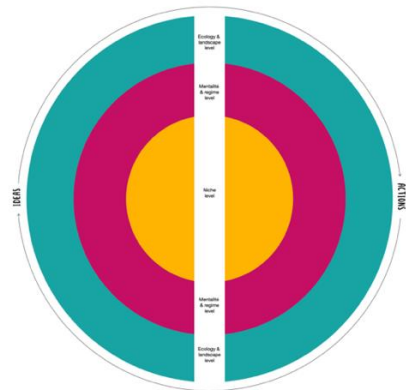|		
MLP-action-eco-system canvas	To explore where action is already being taken and to make this visible as an eco-system of action. Pilot: To map actions and surface ideas to analyse for their potential to amplify existing actions or contribute to transition pathways.	

3.2 Developing design criteria for the MLP

In early adaptations of the MLP, Wallace (2020, 2021) addresses the need for specific and deep contextualisation that focuses on "micro ideas, decisions, actions or events of particular developmental episodes" (Poole et al, 1989, p643) through ecology and mentalité 'levels'. Yet in application, the MLP still requires more contextualisation and attention to reveal the specifics of what Geels and Schot (2007) call, "local sub-plots"—otherwise understood as the deeply specific context of a transition. In this project, iteration and critical collaborative reflection ensured a specificity and responsiveness to the "local sub-plots" of UK/HE/UAL. Through our RtD approach, a set of design criteria has been developed and tested These criteria consolidate, revalidate and expand upon Wallace's previous adaptations and this paper makes both the revalidated and expanded criteria explicit.

Table 2   Generalised design criteria for contextualising the MLP, building on Wallace's prior work and findings from the pilot project

Design Criteria	Purpose	Prior work	Emergent from pilot project
(1) Clarify temporal scope	To use the MLP to map problem evolution, to articulate points for intervention, and to map transition pathways into a possible future relies on temporal clarity of the past, present and future.	Wider temporality (past, present, future) outlined on canvas with a clear time-boundary (backward and forward) observed.	Clear and repeated labels on time-bound columns to aid participants' navigation of the map.
(2) Include complex patterns of thinking	Mapping granular thinking across the system observes the complex interdependencies between ideologies, mindsets, cultural frames, attitudes and beliefs and their impact on behaviours in response to regime rules/norms.	Inclusion of a mentalité level Illustrated coding system to enable sensemaking.	Code pre-populated content and collected data with a set of formal shapes and colours to enable easier sensemaking.

(3) Situate the socio-technical system in the living system	Explicit positioning of socio-technical activity in the living system permits ecological impacts (impact on nature and the impact of nature) to be mapped. This is informed by Aboriginal Knowledge where 'thinking is dependent on the field or context' (Yunkaporta, 2019 p172).	Inclusion of an ecology level to reflect impacts of nature on the socio-technical system and the impacts of socio-technical activity on nature.	

Design Criteria	Purpose	Prior work	Emergent from pilot project
(4) Map the action-ecosystem using the MLP's 'levels' to articulate the 'multi-levelness' of actions	During analysis, identify ideas that are amplifiers of existing actions and observe where fuzziness exists between action in the niche and regime to analyse actions that indicate clustering into a 'niche-regime'	Use MLP 'levels' to map where action is taking effect. Organic shapes reflect the MLP-action-ecosystem as a holarchy of actions — both 'parts of' & 'wholes'.	Explicitly collect and differentiate actions versus ideas.
(5) Provide specificity and context for the MLP	A lack of context and situatedness in the MLP ignores Indigenous knowledge and creates a barrier to the application of the MLP as a tool.	Use descriptive labels to provide context and meaning for the 'levels' including examples of the activities or happenings that can occur there.	Use the MLP canvas to communicate the spatial boundaries of a problem/project. Provide place-based context/ boundaries by pre-populating canvas with a background narrative to provide situatedness with deep contextualisation to help with facilitation.
(6) Observe power relations through the MLP	Power relations are obscured in the MLP, and the conceptual model fails to recognise the intersection of power and change (Avelino, 2017; Wallace, 2020). The general nature of the MLP adds to this obscuring and the roles of actor agency and power in affecting change is ignored.		Mapping power relations on the MLP-problem canvas and using a lens of power to analyse the interdependencies and relationships between events, happenings and dimensions of thinking.

Using the MLP-action-ecosystem to explore where barriers and enablers of action might exist.

These criteria were noted across multiple iterations of the canvases during the contextualisation process for this project, and have been made explicit by synthesising through a comparative analysis across iterations from Wallace's prior work. The final iteration of each canvas has been further customised using UAL branding and specific labelling as part of a toolkit for the UAL context.

The general nature of the MLP as a theory and tool can be addressed through the MLP-problem canvas by providing context specificity through the "local sub-plot", in this project, the context of HE and specifically, UAL. The inclusion of expanded levels in the MLP (mentalité and ecology) and the curation and coding of a pre-populated background narrative helps reflect the temporality and dynamically shifting conditions within this context (see Fig.4). Drawing on Giddens (1984), it is this deep contextualisation that has facilitated the research team's expanded view of the institution as a regime structure that is made up of (and structured by) the variable actions of the actors within it.
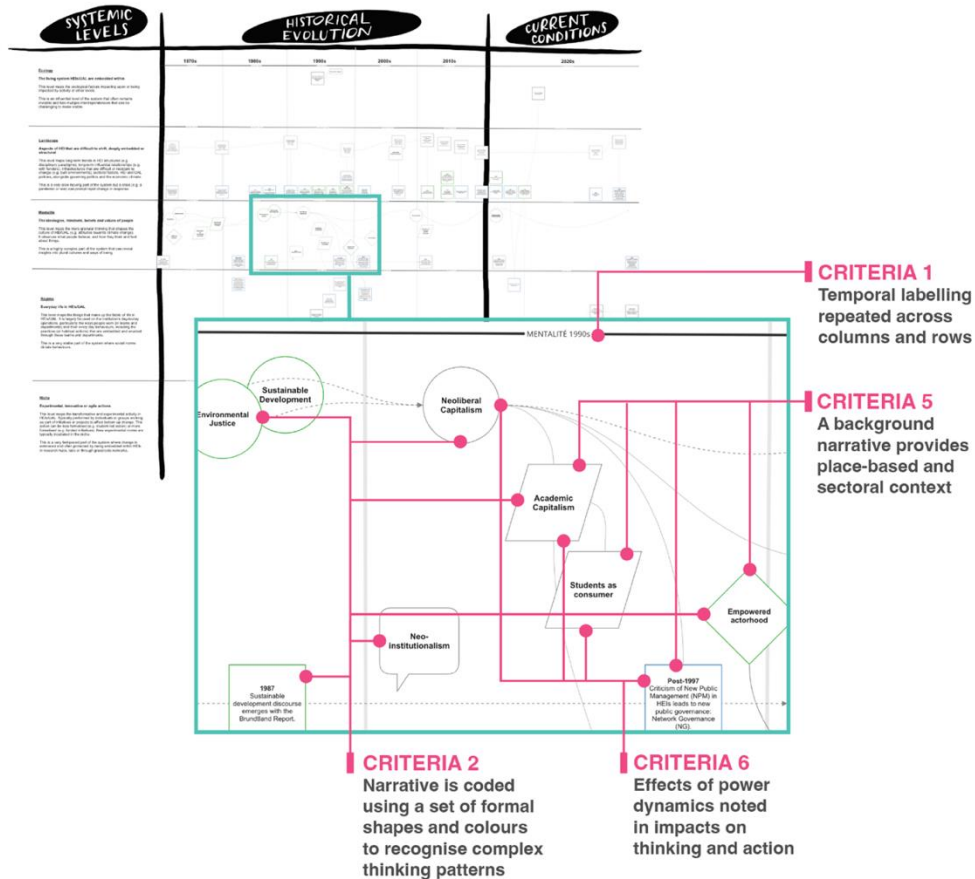
Figure 4 Close up section of pre-populated background narrative to demonstrate how some of the criteria were applied in iteration #9 of the MLP-problem canvas.

4. Discussion and conclusions

Through this paper we have explored how theoretically informed DfT methods and tools can be adapted, re-situated and substantiated within and for HE, by presenting our adaptation and situated use of the MLP. We have made explicit six design criteria to articulate key considerations in adapting the MLP for specific applications, and we have described how these criteria have been applied in the context of UK/HE and UAL. Criteria one to six are contributions in the form of an explicit set of criteria to guide contextual DfT work. In addition to this, criteria six makes a further contribution to DfT that is sensitive to issues of power and agency, this criterion that has emerged from observing the particular dynamics of the HE/HEI context. Below we share early insights from preliminary analysis of data collected/generated by participants through the MLP tools (this will be expanded in future publications).

Power and agency

Early but specific insights about power dynamics and social relations in HEIs have been surfaced through the design processes of contextualising and pre-populating the MLP-problem canvas, through participatory processes in the form of social learning among participants using the canvas, and through preliminary analysis of collected data. The inclusion of selected

information from secondary research (e.g. literature review) on the MLP-problem canvas highlights not only the external influences but also reveals drivers for interconnected actions at a sectoral and local (UAL) level. Early synthesis of collected data with the pre-populated narrative in the MLP-problem canvas through a lens of power is providing a crucial preliminary understanding of the relational dynamics in HE and certainly within UAL.

Collected data through the tool reveals a significant collegiality of relations among staff (regardless of hierarchy) that contributes to (climate) knowledge and action at UAL. This collegiality also manifests as synergies across bottom-up actions. Co-existing are top-down governance and a potential critical of bottom-up action – though this tension between levels can at times slow down action, the tension also reveals the significance of an activation of the middle (regime). There is also a very specific influence of externalities upon organisational conditions that affect the everyday experience in HEIs and, by mapping interdependencies across the MLP with attention to power, we see clearly how influences from outside of education can have significant impact on everything from university leadership to working conditions, to student body composition.

Each canvas developed through this project is intended to activate participants, to enable articulation and sharing of their situated knowledge in relation to a larger project of making the university visible to itself. The canvases thus also serve a function of sharing power with participants by increasing sector and institutional awareness (through pre-populated secondary research and accumulated data collected from primary research in the project), and through increased visibility of the current situation, transition pathways and actions. Exploring the agency held within each participant group has been key to understanding the working cultures of different constituencies and how these interact across groups, while also recognising the potential for each group's discrete work practices to offer a leverage point for change. The dynamics between the many diffuse actors in HEIs, the agency held at an individual level, and relations with power across an institution are specific and crucial in actioning regime-level change. To this end, additional tools and processes were developed to explore actor-agency in relation to climate action more explicitly, and future research will expand this further.

Social practices and cultures in the regime

Although the MLP was not used to collect data about work practices ('Dimensions of Work Practices canvas' fulfilled that objective, see Fig.2), it is evident in the MLP where and how these practices are situated and how they might be leveraged for change. Our decision to explore practices through another canvas avoided generalisation in the MLP and allowed different categories of work (administrative/managerial/academic) to be explored within focus groups. Granular detail of work practices and where their dimensions interconnect or influence one another was made visible through these two tools, thus enabling insights into interconnections across practices (e.g. SPT social practice theory categories) including: materials and infrastructure; skills and expertise for operation, and; ideas, cultural practices and

values. Generalising this as 'work practices' in the MLP does not permit the nuanced exploration that is enabled by a discrete process. However, seeing how/where practices nest within the context of the MLP brings a greater clarity to the potential leverage points accessible to individuals/teams of actors, where agency might be enacted or impeded.

Our attentiveness to the regime has been informed by our understanding of it as a stable 'level' that can be 'tuned into' its context. Recognising the multiple tensions at play offers insights into where destabilisation might be possible through a 'niche-regime', thereby nurturing some conditions for change. For example, UK HE's economic growth culture sits in direct tension with UAL's social purpose and anti-racism commitments, and the UK's unravelling 'net zero' pledge sits in tension with UAL's own commitments. Such tensions influence activity in the regime particularly, for example, where clear policies are absent, where a critical mass of bottom-up action lacks cohesion and/or visibility or where agency to affect change in work practices is impacted by external forces. Synthesising SPT and the MLP provided a more comprehensive understanding of the rules and norms of the regime and how these are enacted through the everyday conditions at UAL.

Our preliminary analysis indicates that the situated nature of HEIs in the regime also comes with a distinct lack of meso-level activity that incorporates and embeds change from the macro (landscape) and the micro (niche). The regime's stability can be perceived as a barrier to change, leaving it overlooked in favour of activating the niche (Arranz, 2017). This is of interest in the HE-setting where the negative influence of the rules, norms, problems and capabilities of regimes and landscapes can hinder the potential for a critical mass of niche activity to stabilise in the regime. For HEIs, this indicates the necessity of a focus on the regime as a setting for cultivating the conditions for change. In the regime, the vertical and temporal nature of the MLP can be somewhat tempered through synthesis with the more horizontal view brought by SPT (Hargreaves et al, 2012, 2013), and Geels (2010) also acknowledges the benefit of considering the MLP in conjunction with social theories. It is through this synthesis of SPT and the MLP that key 'sticky' aspects of the regime's stability (e.g. work-life norms, organisational capabilities) can be identified for further analysis. The MLP-problem canvas captures these influencing factors and is complemented by processes that explicitly explore additional 'bottom-up' dimensions such as political voice, justice and decision-making, and 'bottom-up' action captured through the MLP-action-ecosystem.

Taking action

Our adapted MLP canvases provide multiple views of UAL that reflect its position in the regime as both stable and fraught with tensions that might indicate some proximity to the chaos that is common amidst transitions. Different action pathways are identifiable, and each offers leverage points for catalysing and accelerating multi-directional transition pathways. Each holds the potential to increase extraction and/or regeneration, thereby suggesting the MLP-action-ecosystem plays a crucial role as a visible 'tipping-point' to favour action towards regeneration. Although UAL's climate action situates most predominantly in the

niche, there are also clusters of cross-cutting multi-level actions. Our attentiveness to the regime and to making the action-ecosystem visible provides clarity on where a 'niche-regime' could emerge. Of particular interest to us in galvanising such action is the role played by social and work practices and actors' agency to influence these at multiple levels.

Preliminary analysis of data collected through the MLP-action-ecosystem reveals that actions at UAL are somewhat disconnected and largely invisible across the university's six colleges and campuses. Visibility can be an important factor in sustained agency (a participant might be prompted to ask themselves, for example, "am I alone or in solidarity with others?") and impact ("does what I'm doing matter?") and power becomes shared when knowledge and information flows transparently to the system's actors. Without visible interconnected actions accumulating in the niche, it is unlikely to cluster to form a critical mass – the so-called 'niche-regime' that Avelino and Rotmans (2009) argue can contest the regime's stability and potentially 'take over'. By mapping actions using the MLP-action-ecosystem, we can increase communication flows in the system thereby giving niche activity greater visibility. Once visible, an interlinking of actions across the niche and into the regime becomes possible, an act which we are proposing creates the conditions for the emergence of a 'niche-regime' at UAL.

Collected data reveals that multi-level action is already present in UAL, with links that cut across the niche, regime and mentalité. Capturing action through the 'levels' of the MLP has revealed the 'multi-level-ness' of action, allowing its affect across the levels to be studied, and in the future, measured and monitored. This supports the recognition of landscape and regime activity in addition to the niche, and reveals where additional 'leverage points' (Meadows, 1999) might situate, which in turn aids the visibility of transition pathways that could accelerate and stabilise action in the regime.

4.1. Conclusion

We have outlined in this paper a key element in our pilot project, in which theory-grounded (e.g. MLP, CAS and social practice theory) DfT tools for HE context-specific application have been developed through RtD. We have responded to some critiques of the 'non-field field' of DfT, specifically calls for examining implications of contextualization, growing the 'how to…' knowledge base, and advancing approaches to issues of power and agency. Critically studied in relation to Wallace's prior work, our reflexive and responsive adaptation of the MLP in HE/UAL results in six explicit design criteria for MLP tool contextualisation. Future publications will present our findings about additional tools and methods from the pilot, further earnings for Transitions Studies and DfT, HE and HEI in terms of climate and organizational transition, as well as specific findings regarding climate justice in UAL.

This paper presents our theory-grounded adaptation of MLP tools for stakeholder participation in the HE context and our 'live case'. Key design considerations in our adaptation – design criteria (Table 2) are critically discussed in terms of aspects that are context-specific and generaliseable across contexts. As a context for this research, HE and an HEI have been particularly useful for exploring how DfT must and can engage with issues of power, agency,

and change-agency. Co-existing/conflicting governance logics and 'knowledge regimes', collegiality, autonomy and entrepreneurialism, for example, have informed how we have structured our research, including participant selection and other PAR considerations (to be elaborated elsewhere) as well as specific adaptations of our MLP tools (e.g. design criteria 6). For example, through this, specific tensions were exposed between UAL's meso-level stable work practices and how micro-level activism in climate justice and regeneration.

Translating MLP theories into tools designed for stakeholder participation has been important not only as a response to Transition Studies calls for more action-oriented work but also, in our case, to make the university visible to itself for awareness, social learning and deliberation of futures, and to put data collection/generation and pathway planning tangibly in the hands of participants. Aligned with UNESCO and national declarations (Beynaghi et al, 2016), we see potential for institutional and participant experience of this project to further motivate our university and the HE sector as key actors in leading societal (and sustain-able) change. In terms of our own agency as academics, we find ourselves well-placed as 'insiders' to study and drive transitions in the long and short term – thus meeting the responsibilities of privilege that we feel we have at universities as well as the action/impact gap in DfT.

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